# WHO CHRONICLE

VOL. 15, No. 7 - JULY 1961


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WORLD HEALTH ORGANIZATION

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- *Exaggerated and even fraudulent claims are sometimes made by drug manufacturers for their products. A few countries prohibit these misrepresentations by-law, but most have little or no legislation dealing specifically with the advertising of drugs. WHO has just completed a comparative study of the existing legislation in some 22 countries* *(see page 274)*.

- *With only about 51 000 cases of smallpox notified, 1960 appears to be the year with the lowest figure ever recorded* *(see page 271)*.

- *Nobody knows how many lives are lost or damaged every year because of the addition of substances of all sorts, some of them dangerous, to food. In 1955 a FAO/WHO Conference on Food Additives warned that " the size of the problem makes it impossible for any one individual country to undertake all the investigations needed". A Joint FAO/WHO Expert Committee's report on the problem has just been published* *(see page 245)*.

- *How do the polio virus and the rabies virus spread from the site of infection? This has been a subject of controversy for many years, some authorities holding that they spread by the blood stream, others that they spread along the nerves. The cultivation of both viruses* in vitro *has made it possible for the first time to study this question scientifically. Recent experiments at the Institute of Tropical Diseases, Hamburg, show that the rabies virus travels along the nerves from the site of inoculation, multiplies in the central nervous system, and then spreads to involve peripheral muscles at a later stage* *(see page 266)*.

- *Between 1956 and 1960, research workers in the Nile Valley captured and examined thousands of birds of many species migrating from Europe to Africa or from Africa to Europe along this well-defined migration route. Many harboured ticks, especially* Hyalomma marginatum rufipes, *the vector of* Rickettsia conorii, *the causative organism of tick typhus or boutonneuse fever, which is widespread through Africa and found in southern Europe. These and other investigations suggest that migrating birds play a fundamental role in the dissemination of virus diseases* *(see page 264)*.

# THE HAZARDS OF FOOD ADDITIVES

Adulterants, contaminants, and additives are words of opprobrium to the great majority of food consumers, and not without well-founded historical reason. As recently as 1959, 10 000 Moroccans were suddenly and mysteriously stricken with paralysis.[1] This was not due, it was found, to some new disease or some new and severe manifestation of an old disease, but to the addition of mineral oil to the cooking oil they had bought. Adulteration of food in this way by unscrupulous merchants with no thought to its consequences to health is not new. It used to be common practice to add alum to bread to improve its whiteness, and it was by no means rare to add ferrous sulfate to beer to strengthen its taste, or salts of copper and lead to confectionery to give it bright colours, or red lead to cheese to increase its attractiveness to the eye. Additives disguised the deterioration of the food, made it look fresh and attractive when it was old and stale, or helped to pass it off as something other than what it was. Except in the most flagrant cases, too, it was relatively easy to escape detection; for the prevailing state of scientific knowledge up to the nineteenth century made it extremely difficult to convert suspicion of adulteration into certainty. Besides, it was customary to preserve food by the addition of salt, nitre, calcium sulfite, or other preservatives, and it was easy to argue that the substances added were intended in good faith to keep the food in good condition.

Nowadays, adulteration of food is punished in most countries under food and drugs acts intended to protect consumers from the dishonest practices of adulterators, adulterants usually being defined as ingredients added fraudulently to increase the bulk or weight or to conceal inferiority of quality. The fact that adulteration is an offence does not mean that it does not continue to be practised, it being probable that the extent to which it is depends directly on the tightness of the control exercised by the authorities, which obviously varies widely from country to country. But, even if adulterants are no longer being added to food as much as they were, there is a never-ending list of new substances being added deliberately to food. With the increasing use of chemicals in food production, too, the food is more and more frequently found to be contaminated with, for example, residues of pesticides. The ramifications of the food trade are world-wide, and this problem of substances added to or contaminating foodstuffs is nowadays not a local but a world problem. " The size of the problem ", said an FAO/WHO Joint Conference on Food Additives that met in 1955,[2] " makes it impossible for any one individual country to undertake all the investigations needed."

This same Conference adopted a definition of food additives that had been proposed by a Joint FAO/WHO Expert Committee on Nutrition. They are " non-nutritive substances which are added intentionally to food, generally in small quantities, to improve its appearance, flavour, texture, or storage properties ".[3]

## The justification for food additives

What justification is there for adding any chemicals at all to food ? A Joint FAO/WHO Expert Committee on Food Additives that met in 1956 examined the general principles governing the use of additives.[4] They may justifiably be used—it held—to maintain the nutritional quality of a food, especially in countries where the supply of essential nutrients in the diet is marginal or deficient; thus antioxidants may be added to edible fats to preserve *beta*-carotene or pro-

[1] *WHO Chronicle*, 1959, 13, 445.

[2] *Wld Hlth Org. techn. Rep. Ser.*, 1956, 107, 6.
[3] *Wld Hlth Org. techn. Rep. Ser.*, 1955, 97, 30.
[4] *Wld Hlth Org. techn. Rep. Ser.*, 1957, 129.

vitamin A. They may be used to enhance keeping quality or stability, so reducing wastage of food; examples are antioxidants, antimicrobial agents, inert gases, curing agents for meats, spices. They may be used to increase the appeal of a food to the consumer (as for example, colouring, emulsifying, flavouring, stabilizing, thickening, bleaching and clarifying agents), thus preserving a constant colour in, say, butter and cheese —whose colour varies with the seasons—or in canned and pulped fruit, improving the texture of bakery products, imparting smoothness to ice cream, or giving uniform consistency to processed fats like margarine. They may be used in food processing, the present-day large-scale manufacture of foods of constant composition and quality needing stabilizing, clarifying, oxidizing and sequestering agents, acids, alkalis, buffer salts, and other processing materials.

Additives cannot—the Joint Committee held—justifiably be used to disguise faulty processing and handling techniques or to deceive the consumer. Strong flavouring substances should not, for example, be used to mask incipient putrefaction or conceal stale or inferior materials. Nor should they be used when they substantially reduce the nutritive value of the food, or when the desired effect can be obtained by good and economically feasible manufacturing practices.

Above all, additives should not be used when there is the slightest doubt about their safety. This means more than that the additives themselves should be safe. It means also that it must be shown that the additives do not produce substances in the food that are harmful. This they might do either when they are added to the food or afterwards, during processing, storage or preparation in the home. Or they might interact with each other to produce toxic substances, or do harm to essential nutrients in the food. Safety also includes consideration of the people who are going to consume the food, some of whom may, because of their physiological state or organic disease, be specially sensitive to the additive concerned—those suffering, for example, from parasitic diseases, malnutrition, or certain degenerative conditions. An important point to be remembered at all times is that while easily identifiable foods are readily avoided, food additives may not be.

Food additives are obviously here to stay. In the highly developed countries, the consumer demands highly attractive foods, uniform quality, and a wide choice at all seasons. Many foods are imported from distant countries to meet this demand, and need processing on arrival. Consequently the food additives used are many and varied. Even in the less developed countries, where processed foods in variety are not commonly found, there is an increasing use of food additives. Many of these countries are in tropical or sub-tropical areas where the preservation of food has its own special difficulties and the means of controlling additives are limited or non-existent; the increase in their use is thus a matter of concern.

**The safety of food additives**

Clearly additives that are harmful to health are to be condemned, but on what basis are additives adjudged harmful to health ? There is no doubt about the addition of adulterants, of mineral oil to cooking oil as in the Morocco incident, or of red lead to cheese. But what of legitimate additives apparently not harmful to man if taken in small quantities but about the long-term ingestion of which nothing is known ? Some of these substances may be stored in the human body rather than broken down or excreted, and may after a certain threshold is reached begin to exert deleterious effects. Some may not be acutely but chronically toxic. Evidence of their safety is most often derived from study of the reactions of experimental animals to the administration of the food additives or of the processed food itself. A Joint FAO/WHO Expert Committee on Food Additives meeting in 1957 examined procedures for the testing of food additives to establish their safety for use.[5] As additives (said the Joint Committee) may be taken for the greater part of a lifetime and produce reactions hitherto unsuspected, relatively

[5] *Wld Hlth Org. techn. Rep. Ser.*, 1958, 144.

much higher doses of the additives than human beings are likely to receive should be fed to the experimental animals for most or all of their lives. No single pattern of tests will do for all the many additives, hence the Committee could only make general recommendations, and even so it admitted that absolute proof of non-toxicity could not be established, since there may always be the occasional case of idiosyncrasy.

The best evidence—the Joint Committee admitted—for the safety of food additives is from human studies. Because there are difficulties in conducting these, reliance must be placed on other methods, among them animal experiments. The use of high dosage levels and the spread of the investigations over a number of different species make it reasonable to extrapolate the data to man. Even then, some margin of safety is desirable to allow for species differences in susceptibility, the numerical difference between the test animals and the human population exposed to the hazard, the greater variety of complicating disease processes in human beings, the difficulty of estimating human intake, and the possibility of synergistic action among the additives.

**The danger of cancer**

The length of the list of chemical agents causing cancer is increasing. The threshold of action of some of these agents is low, summation of effects probably occurs, and the effects, unlike those of many toxic agents, are also probably irreversible. In man 92% of cancers occur in epithelial tissues, whereas these tissues take up only 17.5% of body weight. As the epithelial tissues are those most subjected to external influences, it is not surprising that polluted air, inhaled dust, tobacco smoke, and other tissue irritants have been closely examined for carcinogenic substances. So too have substances ingested, among them, in recent years, food additives. Another Joint FAO/WHO Expert Committee on Food Additives that met in 1960 devoted its session to an evaluation of their carcinogenic hazards.[6]

[6] *Wld Hlth Org. techn. Rep. Ser.*, 1961, 220.

The Joint Committee found information on the toxicity or potential carcinogenicity of many food additives to be lacking. Where there is information, the design, execution, and interpretation of some of the experiments reported are inadequate, and corroborative evidence is missing. The Joint Committee therefore set out in detail the principles to which such tests should conform, the factors that must be taken into account—such as identity and purity of the material under test, the kind and number of the animals to be employed, the duration of the experiments, the diet to be given to the animals, periodic and post-mortem examinations, the dosage range in oral tests, control groups—and the criteria on which the interpretation of the results must be founded.

In principle, the Committee agreed, experimental studies cannot at present provide an absolute safe level for carcinogens in human food. Research and development in pharmacology and therapeutics are largely dependent upon the extrapolation of animal experimental studies to man. But it is safer to apply to man the results obtained from the administration of a pharmacologically active agent that rapidly produces a measurable reversible effect than those involving a process such as carcinogenesis which, as far as is known, is irreversible and may take many years to become apparent. Furthermore, the pharmacologically active agent is normally administered intermittently and is subject to some measure of control, so that unexpected deleterious effects are likely to be detected. A carcinogenic agent may be taken daily throughout a lifetime, with little likelihood that the relation between it and a cancer occurring long afterwards will be recognized. It is possible, since it has been shown that there is a relationship between dose and response in carcinogens, that dose levels exist that would not induce cancer (though carcinogenesis is such a complex phenomenon that even this cannot be taken for granted). Prudence, however, precludes the establishment of a safe dose at the present time.

If a safe dose of an additive cannot be laid down and experimental studies in animals show that it may be carcinogenic, what then

should be done? No easy answer to this question can be given. Some of these additives or contaminants play an important part in the production of food or in the preservation of the community's health. DDT, for example, is widely used for spraying in malaria control campaigns and against many insect pests. As a method of controlling insects it is invaluable, and it has raised health standards in many parts of the world, but it is a food contaminant and has been shown to be a weak carcinogen in rats. The decision whether to use a carcinogen as a food additive or to prevent it from being a contaminant must therefore rest upon an assessment of the risks and the benefits it brings to the community and the individual consumer. There are various possible courses of action. A carcinogenic agent can be excluded from the list of food additives permitted. If it occurs in the general environment and contaminates food, tolerance levels can be fixed. If it is a secondary contaminant, specifications can be laid down that will ensure that it is kept to the lowest practicable level. If it is a pesticide, it may be banned on food crops, its use may be controlled, or the residue may be reduced to the level at which it is no longer detectable by a sufficiently sensitive method.

It is no easy task to make sure that food additives are free from harm. The first step is to disseminate information as widely as possible. In accordance with a recommendation of the Joint FAO/WHO Conference on Food Additives that met in 1955, FAO began in 1956 to issue a monthly bulletin entitled *Current Food Additives Legislation*, which presents abstracts of proposed new legislation and amendments to existing legislation. WHO and FAO have also begun the preparation of data sheets for a number of food additives. One on food colours has been completed. Others on such subjects as antimicrobials, antioxidants, and emulsifiers are being drawn up. By such means as these, FAO and WHO hope to keep governments constantly aware of the hazards of food additives and of the advances made in keeping additives safe for human consumption.

## HEALTH AND SANITATION

The Seventh European Seminar for Sanitary Engineers was convened in Madrid in October 1960 by the WHO Regional Office for Europe to discuss public health problems in sanitary engineering in Europe. Some of these problems are of a wide interest and are reviewed below.

### Air pollution

In a paper [1] presented to the seminar, Dr Wilkins, of the Department of Scientific and Industrial Research, Stevenage, England, pointed out that much effort is devoted to maintaining high standards of purity for the food we eat and the water we drink, but much less to maintaining the purity of the air we breathe. "The atmosphere continues to be used as a kind of sewer for the disposal of noxious gases and particles with the result that the air of many cities and industrial areas is laden with pollutants which are a source of economic loss, a social evil and a menace to public health." On behalf of WHO Dr Wilkins had visited research and other centres in the European Region to study the problems of air pollution and had found that one of the main problems everywhere is evaluation of the contaminants.

Industrial processes in a modern community emit a variety of air contaminants, those causing the greatest problems being the result of complete or incomplete combustion of fuels used in factories, homes or transport vehicles. In 1958 the WHO Expert Committee on Environmental Sanitation [2] pointed out that one step towards the reduction of air pollution is objective evalua-

[1] Wilkins, E. T. (1960) *Air pollution investigations and control* (Unpublished working document EURO-9.7/3).

[2] *Wld Hlth Org. techn. Rep. Ser.*, 1958, 157.

tion of air contamination by dustfall, smoke and sulfur dioxide, which largely result from the burning of fuel, and that much can be accomplished by the use of simple methods of measurement. Such methods are being applied in various countries, in some by government agencies, in others by government agencies and industry as well, together or separately. Dr Wilkins discussed the procedures in use and urged standardization both of methods of measurement and of the terminology of air pollution—a need already stressed by the WHO Expert Committee on Environmental Sanitation and the Organization for European Economic Co-operation. It is common practice to make routine measurements of air pollution in the neighbourhood of particular industrial plants and in towns. Effective control, however, has been hampered by lack of knowledge, both of the relationship between the observed concentrations at ground level and the various factors involved in the emission and dispersion of the pollutants and of maximum allowable concentrations (MAC) on the basis of the health hazard or other damage or nuisance caused. Some air pollutants produce chronic effects only after years of exposure and the experimental difficulties of determining MAC values are therefore very great, so that some medical authorities see little prospect of settling this problem by conventional techniques. In the USSR, MAC values have been recommended as a result of studies of the effects of very low concentrations of air pollutants on the higher nervous activity of animals (as indicated by their conditioned reflexes) and other sensitive experiments on animals and humans. In Germany plants are used for the studies, on the assumption that they are at least as sensitive, particularly to sulfur dioxide, as humans.

In the discussion on this paper the use of dustfall as a criterion of air pollution was challenged, on the ground that, being composed of particles mostly coarser than 10-20 microns in size, it is unlikely to be a factor in respiratory disease. This was countered by the argument that progress in the control of air pollution is liable to be slowed down if too much emphasis is placed on the health aspects because of the difficulty of proving the effects of pollution on health; it is a sufficient reason for controlling pollution that it is a nuisance.

As regards the toxicity of pollutants and "smog", the belief is increasing in the United Kingdom that smoke causes chronic respiratory disease, either alone or in synergistic association with sulfur acids. The techniques being used by the Medical Research Council of Great Britain to establish this relation (the comparison of day-to-day changes in the pollution of the air with the morbidity of the population in the polluted area) seem particularly promising. It might be possible with these techniques to isolate the various parameters concerned and their physiological effects by co-ordinated experiments in countries differing in the amount and kind of pollution and in other characteristics.

A proposal that wild animals be used to observe the threshold effects of air pollution led to a discussion of the methods used in the USSR to determine MAC values. One of these adopts as criterion the stage at which the human being begins to lose his ability to identify geometric shapes under low illumination; another the slowing down of the responses of an animal conditioned by a stimulus to seek food. These methods, based on the view that MAC values so derived would probably be on the safe side, deserve study.

### Health and housing (with special reference to sound insulation)

The author of a working paper on this subject [3] held that the study of building regulations as a means of protecting and promoting mental and physical health is an extremely practical approach to housing. One vitally important aspect in a world that is daily growing more noisy is the provision of adequate sound insulation in the home. Psychological research has shown

[3] Basart, A. H. M. (1960) *Building regulations as a means of protecting and promoting public health with specific consideration of sound privacy in dwellings* (Unpublished working document EURO-9.7/4).

that noise has a detrimental effect upon home life, leading to inadequate sleep at night, conflict in the family and outside, disturbance in marital relations, and educational difficulties. If we acknowledge the right of individuals to "sound privacy" we must provide them with legal means to protect this right.

This paper is a survey of a study made at the suggestion of WHO. We have the knowledge today to construct dwelling-houses conforming to reasonable standards; but these standards are not always legally required or realized in practice, one of the reasons being a faulty appreciation of the importance of a good housing environment for the developing individual and family.

Is the question of reasonable housing, and therefore of proper sound-proofing of houses, one for the sanitary engineer or even for WHO? The seminar thought that it is; there is no doubt about the evil effect of noise on health and there seems to be no question of its not coming within the positive definition of health and its protection adopted by WHO. Although many of the sanitary engineers attending the seminar are primarily interested in sanitary engineering as it concerns water supply and the handling of wastes, they agreed that the inclusion of other aspects of environmental sanitation such as air pollution and housing appears to be a logical and proper broadening of the scope of sanitary engineering, at least in Europe.

To increase quality requirements for dwelling construction—as, for example, to specify sound-proofing—means to increase building costs and may mean fewer dwellings built. This is a difficulty in areas where there is a serious housing shortage. Another of a different kind is that individuals differ in their reactions to noise, both absolutely and as they grow older. This is likely to complicate the question of standards of sound insulation.

## Water supply and purification research

A paper presented to the seminar by Professor Minz, Deputy Director of the RSFSR Academy of Municipal Economy, Moscow, described research into the purification of drinking water in the USSR.[4] Increased urbanization, the development of industry, improved amenities in the home, and the rapid extension of piped water supplies have made this a project of high priority. One of the aims of research has been to reduce the cost of water purification equipment; another has been to discover the most rational treatment for the various kinds of water found throughout the country.

Research has shown that rapid conventional sand filters with a filter bed 70 cm thick and an average filter-grain diameter of 0.7-0.8 mm, operating with a filtration velocity of approximately 6 m per hour, have in general a wide margin of reliability and work uneconomically. The RSFSR Academy of Municipal Economy has produced a filter, using two filtering layers; the upper one works like a conventional rapid filter, the lower uses grains of diminishing size. This type of filter is cheaper and more efficient than the conventional rapid filter.

Another economical method of purification now used is by contact clarifiers. The contact clarifier is a reservoir filled with sand and gravel of defined thickness and size of particle, and its use has solved the problem of treating coloured water or water with a content of suspended solids of up to 150 mg/l.

The most widely used method of water disinfection in the USSR is chlorination. But chlorination has disadvantages, and ozone and ultra-violet rays have been the subject of research, both methods now being used in some installations.

## Small community sewage wastes

One of the papers presented to the seminar[5] reviewed the sewage disposal processes in

[4] Minz, D. (1960) *Some results of research into drinking water purification and disinfection* (Unpublished working document EURO-9.7/1).

[5] Paz Maroto, J. M. (1960) *Conventional methods of sewage treatment for small communities (septic tanks, Imhoff tanks and filters)* (Unpublished working document EURO-9.7/10).

most common use in small communities, and recent improvements in these processes. The installations must not pollute surface or underground waters; or become a breeding place for insects; or emit offensive odours. The handling of excreta must be reduced to a minimum. The construction and operation must be simple, and the cost must be low. There are various methods of sewage treatment in use, some relatively new, each with its own advantages. One paper [6] described methods in use in Germany, other papers stabilization ponds in the USA [7] and oxidation ditches in the Netherlands.[8] In the German Federal Republic in 1956, 3500 communities with a total population of 35 million had a daily sewage flow of 9.5 million $m^3$. Of this amount of sewage 7% was treated by screening, 52% mechanically, 10% mechanically and biologically, 3% chemically, and 4% by irrigation; 24% being left untreated. An interesting point is that the use of sewage for agriculture is considered harmless in the German Federal Republic provided certain conditions are observed. These conditions are that the sewage is given preliminary treatment by sedimentation for two hours to allow the coarser particles (those containing large numbers of bacteria and most of the eggs of worms) to settle properly; that vegetable beds are irrigated only up to the time of planting; and that hay fields are irrigated only up to a fortnight before cutting.

The participants in the seminar agreed that stabilization ponds and oxidation ditches provide a practicable solution to the problem of the disposal of sewage wastes in small communities. Various factors have to be taken into account, however: the local situation, the area available, and the financial possibilities. In Europe the high cost of land in some places is against the use of stabilization ponds; and the cost of operating oxidation ditches may be a serious limitation to their installation.

There was some difference of opinion on the question of the thermal or complete sterilization of sewage. One group thought that it should be restricted to very special cases where the destruction of all pathogenic bacteria is required as, for example, in remote hospitals or sanatoria or in centres of production of virus vaccine for veterinary use. Even then it should be used only after a full study of the comparative efficacy of the classical processes. Another group held that effluents from animal disposal or rendering yards should always be disinfected; that sewage should be disinfected before being sprayed over vegetables; that the effluents from tuberculosis hospitals and hospitals for infectious diseases need not be disinfected if discharged into an urban sewerage system but should be if the hospitals are isolated or (in the case of tuberculosis hospitals) if the effluent is discharged into a stream from which cattle might drink; and that disinfection might be required seasonally in relation to summer bathing in sewage-polluted waters. Some participants believed that thermal sterilization is necessary when chemical disinfection is insufficient or uncertain; others that the concept of sterilization should not be retained in the field of public health—only the concept of disinfection and disinfestation.

The provision of sewage disposal installations for small communities should be an integral part of a general plan for the sanitary improvement of a basin or area of receiving waters—a plan that should always keep local conditions in mind. Not that this is an easy thing to do; it was argued on the one hand that there should be an agreed standard for sewage effluent, on the other that rivers should be graded and a standard for river water determined up to which the effluent would have to be purified. This river standard would depend upon the flow, the downstream use of the water, the growth of the population, possible future industrial development and similar factors—all difficult to assess.

[6] Kruse, H. (1960) *Some present-day sewage treatment methods in use in Germany for small communities and special installations, including thermal disinfection of sewage* (Unpublished working document EURO-9.7/11).

[7] Okun, D. A. (1960) *Experiences with stabilization ponds in the US* (Unpublished working document EURO-9.7/12).

[8] Baars, J. K. (1960) *The use of oxidation ditches for treatment of small community sewage* (Unpublished working document EURO-9.7/13).

**Nuclear energy and sanitary engineering**

For this theme the participants in the seminar had before them a paper [9] on the sanitary engineering aspects of nuclear energy developments. After discussing the biological effects of radiation and fall-out, the presence of strontium-90 in drinking water, and sources of radiation, this paper considers at length methods for the disposal of radioactive wastes. These may be highly active, medium active, or low-level liquid effluents, reactor wastes, laboratory wastes, wastes from the mining or milling of uranium ores, or solid wastes, all of which set their own problems. In addition to the disposal of wastes, there is the question of the siting of nuclear energy establishments; and, finally, there is the need for adequate area monitoring.

One of the participants gave an account of the disposal of medium-active liquid waste in the ground as practised in the USA, emphasizing that this method is possible only when suitable conditions exist. Fission product wastes, he went on to say, can be converted to solid form and stored as solids, by absorption or sorption on clays or other natural ion-exchange materials, mixing to form concretes, fusion to glasses, or calcination in fluidized beds. Storage might be in salt mines, old oil wells, uninhabited deserts, or the arctic regions. The thorny question of disposal at sea is under consideration by the International Atomic Energy Agency, a representative of which described the present situation.

It was generally agreed that the sanitary engineer should have instruction in public health protection against ionizing radiation, and one group of participants stressed the importance of knowledge of the behaviour of radioisotopes in receiving waters and of economical and efficient filters for the removal of radioactivity from rainfall or surface waters. Appropriate technical information on radioactivity hazards and their control should be disseminated to sanitary engineers on as wide a scale as possible. International agreement on the disposal of radioactive wastes should be sought and perhaps international facilities could be made available. The dangers of luminous watches should be stressed; and the radioactivity of surface water supplies should be measured periodically.

[9] Kenny, A W. (1960) *Sanitary engineering aspects of nuclear energy developments* (Unpublished working document EURO-9.7/14).

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### *Antitrachoma campaign in Morocco*

The antitrachoma campaign undertaken by the Morocco Government with WHO assistance has aroused widespread public interest in the prevention and cure of contagious eye diseases. The mass treatment of eye diseases at schools has led to a wave of enquiries from parents to schoolmasters on how they may treat their children of pre-school age. It is also reported that the sale of antibiotic ointment has greatly increased.

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# SURVEY TECHNIQUES IN PSYCHIATRIC EPIDEMIOLOGY

An Inter-Regional Conference on Techniques of Surveys on the Epidemiology of Mental Disorders was held in Naples from 6 to 15 December 1960. It formed part of the long-term programme in this field that was started by WHO in 1956.

The first step had been a study of epidemiological methodology as applicable to problems of mental health. After consultation with other experts, Professor D. D. Reid, of the London School of Hygiene and Tropical Medicine, drafted a technical memorandum on this topic, which was then discussed and amended at a meeting of experts held in London in September 1958, jointly sponsored by WHO, the Milbank Memorial Fund, the Medical Research Council of Great Britain, and the World Federation for Mental Health. The finished manuscript was subsequently published in the WHO *Public Health Papers* series.[1]

In 1958-59 a systematic study of the present state of psychiatric classification was carried out. A large number of old and new classifications were analysed by Professor E. Stengel, of the University of Sheffield, and the resulting paper was also published by WHO.[2] The topic was again discussed at a conference in New York in February 1959, organized by the American Psychopathological Association, at which WHO was represented by Professor Stengel and several WHO staff members.

In June 1959 the whole field of psychiatric epidemiology was discussed by a WHO Expert Committee on Mental Health,[3] which stressed the urgency of surveying the prevalence and incidence of mental disorders and the need for specialized training in epidemiological techniques.

The Inter-Regional Conference in Naples was called in order to make leading psychiatrists, health statisticians and public health officers of Southern Europe and North Africa better acquainted with the possibilities and technical difficulties of epidemiological studies. The topics discussed were:

(*a*) Sample surveys of prevalence, with special reference to the census method and the relationship of general demographic factors to mental health conditions.

(*b*) Surveys based on hospital populations, with special consideration of the problems of retrospective and prospective cohort studies and the possibilities of using hospital populations for the assessment of treatment results.

(*c*) Studies on social influences on psychiatric pathology and their interaction with genetic factors, with special reference to the epidemiological problems of migrating populations and the validation of results by the study of appropriate control groups.

For each of these topics two discussion leaders had been appointed: for topic (*a*) Dr E. Essen-Möller, Professor of Psychiatry, University of Lund, Sweden, and Dr K. Rawnsley, Member of the Scientific Staff, Medical Research Council of Great Britain; for topic (*b*) Miss E. M. Brooke, Statistician, General Register Office, United Kingdom, and Dr K. Jones, Lecturer in Social Administration, University of Manchester, United Kingdom; and for topic (*c*) Dr Ö. Ödegaard, Professor of Psychiatry, University of Oslo, Norway, and Dr Y. Champion, Médecin des Hôpitaux psychiatriques, Paris, France. All of these discussion leaders prepared short notes on the subjects for which they were responsible. In addition, Dr E. E. Krapf, Chief, Mental Health, WHO, and Professor T. Lin, of the National Taiwan University, Taipeh, and Mrs C. C. Standley, WHO, prepared background papers of a more general character.

[1] Reid, D. D. (1960) *Epidemiological methods in the study of mental disorders*, Geneva (*World Health Organization : Public Health Papers*, No. 2).

[2] *Bull. Wld Hlth Org.*, 1959, **21**, 601.

[3] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **185**.

The paper by Dr Krapf was on " Epidemiology: its uses and its difficulties in the mental health field ". He listed seven major uses of epidemiology in the study of non-communicable diseases, as recently formulated by Dr J. N. Morris, of the Medical Research Council of Great Britain, and pointed out that they can be divided into two main groups, the first being of special value for operational purposes (e.g., studies of the distribution of health and disease in a community or of the workings of the health services), the second being concerned with the etiological and physiopathological structure of disease. Referring to specific difficulties, he mentioned that in the causes and manifestations of many psychiatric diseases there are often individual factors that cannot be quantified. He also said that the number of factors involved in the etiology of these disorders often complicates their study, and that in psychiatry it is particularly difficult to identify a " case ".

The subject of the paper by Professor Lin and Mrs Standley was " Survey approaches to the epidemiology of mental disorders ". Of these approaches, the one with which they were particularly concerned was the population morbidity survey, which aims at " measuring prevalence, or ideally incidence, of mental disorder through investigation of the whole or a sample of the population and at discovering associations with variables that may have a bearing on the causation of mental disorder ". Although field studies covering the whole of a country are the ideal method of obtaining a reliable prevalence rate for mental disorder, surveys of sample populations have proved the only practical method so far. The four techniques most commonly used for these surveys were discussed and exemplified. These are: (*a*) surveys of random samples of the total population of a country; (*b*) comprehensive household surveys within a defined district; (*c*) random sample surveys within a defined district; and (*d*) surveys of selected subgroups of a population.

At the opening session of the Conference, Dr Ernest Gruenberg, whose services were made available by the Milbank Memorial Fund, presented a paper on " Five problems in the epidemiology of mental disorder ". Dealing with the first of these problems, the frequency of mental disorder, he reviewed studies on the subject using first-admission rates of a population, the prevalence of hospitalized cases at a given time, and fluctuations in the prevalence of long-stay cases. Dr Gruenberg then examined the question whether foetal brain damage accounts for some cases of mental deficiency, basing his examination on studies of seasonal fluctuations in the risk of mental deficiency at birth and of relationships between complications of pregnancy and mental retardation, epilepsy, and various reading disabilities. The next problem considered was the part played by maternal deprivation in the development of mental disorder; several studies have shown this factor to be of importance but less direct in its influence than some authors have inferred. The fourth problem concerns a more specific disorder whose nature has recently become clearer as a result of laboratory studies with cell cultures and chromosomes: mongolism, now known to be due to a tripled chromosome (trisomy) at the No. 19 chromosome. Finally, Dr Gruenberg referred to the problem of the circumstances surrounding group outbreaks of psychotic illness.

The main work of the Conference was done in group sessions. Three groups, each consisting of 6-10 participants, considered in turn the three topics selected for discussion.

**Morbidity studies based on population surveys**

Professor Essen-Möller stressed the importance of carrying out population surveys on mental disorder outside the hospitals because of the possible bias of hospital statistics. He outlined methods of choosing the population sample for study, described the pitfalls to be avoided, and showed how case-finding should be carried out within the chosen sample (registers, informants, and household surveys). His paper included a description of the techniques used in a rural area near Lund.

Dr Rawnsley referred to the work in psychiatric epidemiology now being carried out in South Wales. Among other points, he

mentioned the wide use of selected groups for morbidity inquiries and the value of the long-term retrospective approach and the census method involving the psychiatric examination of a representative sample of the population. He warned, however, that the use of this method " to estimate psychiatric morbidity in populations must take account of current local attitudes to mental disorder ".

In the group discussions on this topic, both extensive and intensive surveys were considered. The extensive survey covering a relatively large population is principally useful for securing information about the severer forms of mental disorder (mainly the psychoses), is dependent largely on informants, questionnaires, and lay observers, presents on the whole simplified data, and is primarily useful for practical purposes. The intensive survey, on the other hand, concentrates on a relatively small population, can pay more attention to the less severe but more differentiated forms of mental disorder (behaviour disturbances and the neuroses), and relies more on direct examination and observation. It requires highly trained professional workers, and the results are in the main more accurate, though more complicated. A warning was given about the difficulty of drawing general conclusions from studies of isolated communities, owing to such complicating factors as intermarriage, uniformity of occupation, and possible high rates of migration.

Various approaches to population surveys were discussed, including the retrospective method based on the medical history of the persons interviewed and the prospective method in which a cross-section of the population is interviewed and seen again a few years later, new cases or relapses then being noted. Population samples should be clearly defined according to age, sex, occupation, and social status.

The attitude of the community to mental disorder is of some importance, and preliminary anthropological studies of the population may be required. The personal attitude of the interviewer is also important, since it tends to influence the results. Nevertheless, the interview, though less objective and standardized than the questionnaire, may be better received by the population and give better results. In particular, the skilled interviewer can observe and take into account the personal reactions of the subject to the questions asked.

It was suggested that survey staff might include medical students, although in many countries their training in psychiatry is inadequate. Their participation in such surveys would give them a better idea of the relative frequency of the different types of mental disorder, their social repercussions, and the importance of tracing and prevention. It was felt that psychiatric training at medical schools should be improved, and that everything should be done to make the general practitioner and the public more aware of mental health problems. Otherwise the data collected will tend to be inadequate and inaccurate.

### Morbidity studies based on hospital data

Dr Jones spoke of the value of hospital data for both local and national studies. Such studies might take the form of, for example, a patient census, an analysis of admissions and discharges or of waiting lists, or a follow up of discharged patients. Hospital records can be used for both retrospective and prospective studies, but adequate controls are essential. Results must be objectively and critically analysed.

Miss Brooke stressed the need for carefully devised and completed data sheets for case records. She listed factors other than prevalence and incidence of disease that may affect admission rates to mental hospitals: for example, shortage of hospital beds, the attitude of doctors or the general public, and the availability of community facilities. Nevertheless, hospital data are of value in the planning of accommodation, for epidemiological studies, and for research work on special topics.

In the group discussions, the general consensus was that, while hospital data cannot show the actual incidence or prevalence of mental disease, they contain important items of epidemiological interest—e.g., the patient's

age, sex, and marital status, the diagnosis, the period of hospitalization, etc. Moreover, they are available, they are frequently standardized, and they are usually more comprehensive than data from private practitioners.

Hospital data are particularly valuable, it was considered, in the epidemiological study of the psychoses and, when well compiled, can be very useful in assessing general trends in the mental health of a country as a whole. They are also useful in establishing the need for psychiatric care and in measuring the results of treatment. However, epidemiological studies based on hospital records should, where possible, be complemented by "research in depth" conducted through personal interviews.

It was agreed that the diagnosis on discharge is usually more important for epidemiological studies of mental disorder than the diagnosis on admission. It was suggested that both be included in hospital records, and that the final diagnosis cover the etiology, symptoms, and personality structure.

Admission and discharge rates in themselves tell little, and are influenced by many factors, such as the desire of the hospital administration to show a rapid turnover, the manner of recording patients on leave, and the unwillingness of some physicians to certify voluntary patients. It is important to know, for each admission, whether the patient is entering hospital for the first time or not, both for general morbidity statistics—which might otherwise be falsified—and for the patient's general history.

There was general agreement on the need for national centres where hospital data for whole countries could be collected and processed.

**Application of epidemiological methods to etiological problems**

Dr Champion spoke of the place of migration studies in epidemiological research in the field of social psychiatry. Morbidity rates for mental disorders have been found to be higher among migrants than among settled populations. These rates have been studied differentially by age, sex, matrimonial status, economic level, etc. Trends in incidence have also been examined according to time of migration, ethnic and national group, and characteristics of the environment of immigration. Such studies are extremely complicated because of the large number of variables to be taken into account, but should prove valuable in investigating environmental factors in the etiology of psychiatric disorders.

Professor Ödegaard referred to the highly complex pattern of inheritance of mental functions and their intimate interplay with genetic factors. Studies on monozygotic twins have thrown light on the genetic element in the etiology of some mental disorders. Certain etiological mechanisms have been elucidated through epidemiological studies, e.g., the effects of social and economic status, marital status, rural versus urban residence, social mobility, race and culture. Hospital statistics may be of use in these studies, particularly where—as in Norway and New York State—a central registration system makes it possible to follow each patient through successive hospital stays. Intensive studies of smaller population groups are also needed in psychiatric epidemiology. Valuable contributions in this field can be made by public health officers and general practitioners.

During the discussions on this topic, comparative studies of mental disorder among migrant and settled populations and single and married persons were reviewed. In nearly all these studies higher morbidity rates have been found not only among the migrants but also among single persons. The results may be interpreted as pointing either to a process of selection or to the beneficial effects of a relatively stable and secure environment.

The effects of migration on mental health were discussed at length. It was pointed out that morbidity rates are similar among the upper economic classes who emigrate of their own free will and those other classes who are compelled by economic circumstances to emigrate. On the other hand, a high morbidity occurs among displaced persons. A good opportunity for study in this field is provided by the migration of Nubians from land that

is to be flooded under the Aswan Dam project. These people are accustomed to voluntary migration to Egypt for work, and their involuntary migration will create a situation of particular interest to the epidemiologist.

One group discussed mental disorders as a reflection of the conflict between the patient and his environment—of " nature " versus " nurture ". Epidemiological methods considered useful for research on this subject include: comparisons between groups of different social status; investigations based on marital status; comparisons between urban and rural populations; studies of social mobility factors.

The epidemiology of suicide and attempted suicide was suggested as a useful subject for study, though the ethical and religious considerations involved would tend to affect the accuracy of the results.

* * *

The reports of the three discussion groups were presented at the concluding plenary sessions of the Conference. The participants then made individual assessments of the possibilities of epidemiological surveys of mental health matters in their respective countries, and of the help that would be needed in carrying them out.

## MALNUTRITION AND FOOD HABITS *

In recent years, as the control of communicable disease has improved, the significance of malnutrition has emerged more clearly. The need to understand its causes has become urgent, for without this understanding there can be no secure foundation for schemes of prevention.

It is now evident that in many countries malnutrition is largely responsible for the high rate of mortality, especially in children 1-4 years old. The combination of disease and malnutrition, the one precipitating and perpetuating the other, has a devastating effect in this age group.

However, there is also evidence that improvements in nutrition (and in housing and hygiene) are more effective against mortality in this older group than against infant mortality. It is reasonable, therefore, that a large part of the resources of money and personnel available for public health work in nutrition should be devoted to this group.

Various forms of malnutrition, as well as general undernourishment, are found throughout the world. Surveys by national and international teams have, however, amply demonstrated that the most serious and widespread deficiency disease found today is protein-calorie malnutrition in young children. This condition occurs where diets are habitually poor in protein (the calorie intake varying from gross inadequacy upwards), and is known by different names in many parts of the world. The severe form, where protein is markedly deficient, is now generally referred to as kwashiorkor—the name given to the syndrome when it was first described some 25 years ago by Dr Cicely Williams.

The public health significance of protein-calorie malnutrition is both direct and indirect. For each child with frank kwashiorkor in a given area, there may be many others less obviously affected but whose growth, development, and resistance to the intercurrent infections of childhood have become impaired. Malnourished children have little resistance to the common diseases of childhood, and frequently die from them. This probably explains why the case mortality in certain infectious diseases in children may be 100 to 200 times greater in areas where malnutrition is prevalent than in those where it is rare.

Protein-calorie malnutrition is a serious public health problem throughout the world. Three specialized agencies of the United

* Based on a summary report by Dr Anne Burgess on a Conference on Malnutrition and Food Habits, sponsored by the Josiah Macy Jr Foundation and the World Federation for Mental Health in co-operation with FAO, WHO and UNICEF, and held from 9 to 14 September 1960 at Cuernavaca, Mexico.

Nations—FAO, WHO and UNICEF—have used their unique international facilities to stimulate interest in and spread knowledge about it.

One of their activities has been the organization of conferences at which authorities on different aspects of the problem and on related problems can exchange their knowledge and experience. Two conferences sponsored by the three agencies and by the Josiah Macy Jr Foundation took place some years ago. The first (1953) dealt with kwashiorkor, the second (1955) had as its theme "Human protein requirements and their fulfilment in practice". A third, sponsored by the Josiah Macy Jr Foundation and the World Federation for Mental Health and supported by FAO, WHO and UNICEF, was held in Cuernavaca, Mexico, in September 1960. It discussed changes in food habits that will have to take place if people are to make better use of the food resources already available or accept and use new foods.

Existing scientific knowledge, if widely applied, could considerably improve the nutritional situation of children in many parts of the world. This knowledge cannot, however, be used where it is needed unless the people themselves want to use it, know how to use it, and are prepared to accept the changes necessary to establish a better nutritional pattern. Unfortunately, there appear to be psychological, sociological and cultural factors that create barriers against rapid changes in food habits. They are less well understood than the impersonal aspects of nutrition and malnutrition.

At the conference in Cuernavaca, nutrition research workers, paediatricians, public health workers interested in nutritional education, and members of the secretariats of the international organizations concerned discussed the human factors involved in changing food habits with experienced anthropologists, psychiatrists and social psychologists.

Studies of the problem as it exists in parts of Africa, India and Guatemala were presented by Dr R. F. A. Dean, Director, Medical Research Council Infant Malnutrition Unit, Kampala; Dr K. Someswara Rao, Deputy Director, Indian Council for Medical Research, New Delhi; and Dr N. Scrimshaw, Director, Nutrition Institute for Central America and Panama, Guatemala. They showed how widely varied are the social, psychological and economic factors that contribute to the prevalence of protein malnutrition and condition the form and acceptance of preventive measures.

A day spent at Tlaltizapan, a rural nutrition centre, brought into focus some of the practical difficulties encountered by the nutrition worker. There, under the direction of Dr F. Gómez, Director, Hospital Infantil, Mexico, a team of doctors, nurses and social workers is carrying out an intensive study of the beliefs, ideas and practices of the people, in order to discover the most suitable approaches to the problem of improving their nutrition. Many of the conditions found in this Mexican village were familiar to most of the participants—nutrition workers from very different parts of the world—and provided a common background for the subsequent discussions.

Dr Margaret Mead, Associate Curator, American Museum of Natural History, whose original work with the Committee on Food Habits of the US National Research Council during the Second World War laid the foundation for future collaboration among the various disciplines in this field, put at the disposal of the Conference a summary of the largest body of research and experiment ever done on this subject. Her contributions to the discussions, based on her study of different cultures and types of change that have occurred in the recent past, set the problem in perspective, and provided much valuable guidance for future efforts to improve nutrition.

Dr A. T. M. Wilson, Special Adviser, Unilever, applied a psychiatrist's knowledge of human needs and differences to the question of nutritional change, particularly in relation to the apathetic individual apparently resistant to change, and to the ways in which opinion is formed and changed in a community. He also compared the extensive research and organization devoted by the business world to the marketing of a new product with the procedures usually adopted

by other agencies when attempting to change food habits.

The social psychologist's experience of market research, attitude and opinion surveys, and motivational studies was presented by Dr J. Stoetzel, Professor of Social Psychology, the Sorbonne, Paris, who also discussed the importance, in the acceptance and rejection of any food, of the "image" presented by that food to the individual.

The immense complexity of the problem of improving nutritional health was reflected in the number of different disciplines represented at the conference, and in the discussions themselves. It was agreed that, while some nutritional deficiencies, such as goitre or pellagra, are amenable to action on a national basis, the relief of protein deficiency in children depends ultimately on the voluntary co-operation of each family concerned.

Government policy, agricultural practices, the economics of the family, the way food is distributed within the family, the beliefs about what the father or the mother or the child should eat, and many other factors have to be taken into account before any improvement in nutrition can be planned. The education required to make any plan effective must be equally comprehensive in its approach, and based on a detailed knowledge of the social and human elements that decide the actions of the individual parent in a given community. The conference recognized and discussed the difficulties of acquiring such knowledge and obtaining suitably skilled personnel for the long-term step-by-step process of education.

Under the chairmanship of Dr Otto Klineberg, Professor of Social Psychology, Columbia University, New York, each of the 40 participants took every possible opportunity to express his or her particular point of view, and many aspects of the overall problem of malnutrition and food habits not mentioned in this brief report were discussed. A fuller report to be published by FAO this year should be of much interest and use to nutrition workers everywhere.

## BABIES OF LOW BIRTH WEIGHT*

A decade ago it was realized that the existing international definition of prematurity (a birth weight of 2500 g or less) adopted by the World Health Assembly in 1948 would not be applicable in certain countries. While of value as a criterion for distinguishing infants who may require special attention (and hence useful in planning public health programmes), it resulted in the reporting of unusually high percentages of premature babies, a large number of whom throve, even without special care. Lower birth weight levels were therefore often adopted locally for practical purposes as the standard for prematurity—levels that varied considerably not only between different countries but even between different hospitals in the same city. Such variations create confusion and prevent statistical comparisons from being made.

### Dearth of facts

The WHO Expert Committee on Maternal and Child Health [1] has now reassessed the situation, on the basis of the preliminary results (covering 23 000 births) of a study on birth weight carried out in 37 institutions in 18 countries and of papers specially prepared by 22 experts in this field from various parts of the world. Its deliberations were, however, handicapped by the lack of sufficient scientific knowledge upon which to base recommendations—knowledge, for example, about the causes of low birth weight and the differing viability of babies of identical weight in different circumstances.

* *Wld Hlth Org. techn. Rep. Ser.*, 1961, 217.

[1] Members of the Committee: Sir Dugald Baird, United Kingdom (Rapporteur); Dr Leona Baumgartner, USA (Chairman); Dr K. C. Chaudhuri, India (Vice-Chairman); Dr F. Gómez S., Mexico; Dr M. Lelong, France (Rapporteur); Professor J. Lesiński, Poland. Secretariat: Dr V. Mary Crosse, United Kingdom (Consultant); Dr A. Minkowski, France (Consultant); Dr F. Mortara, WHO (Secretary); Dr J. S. Peterson, WHO; Dr W. Winnicka, WHO.

It was recognized that investigation of the relationship to the birth weight of such factors as social and economic development, rapid industrialization, poverty, ignorance, and changes in family life is of the greatest importance.

The Committee felt that further research should be made into: methods of caring for babies of low birth weight, and of organizing services for them; the epidemiology of low birth weight (including the development of better methodology); the relation of cultural attitudes to problems associated with premature labour and babies of low birth weight; the effect on birth weight of genetic, environmental, socio-economic and emotional factors, as well as the influence of undue working fatigue, bacterial or viral infections (especially inapparent and subclinical) and parasitic infestations, before and during pregnancy; the biology of the developing foetus (including the placenta) and of the infant of low birth weight; methods for the accurate estimation of the degree of maturity and viability of the newborn infant and the length of gestation; and, as a long-term study, the evaluation of the results of saving infants born after short gestational periods and infants of low birth weight.

**Influence of environment on child-bearing**

The principal findings of the Committee concern the part played by environmental factors in successful child-bearing. A striking degree of reproductive efficiency is shown by women born, reared and reproducing in a good environment; where environmental conditions are less favourable, perinatal death rates rise, birth weights are lower at all stages of gestation, and premature onset of labour is more common. It seems likely that the higher number of babies of 2500 g or less born to such mothers is associated more with deficient growth of the foetus at all stages of gestation than with premature birth.

The preliminary results of the WHO study on birth weight have shown that in areas (most of them under-developed) with a very high incidence of babies weighing 2500 g or less at birth many of the babies are in fact the result of pregnancies lasting 37 weeks or more and behave like " mature " babies. The study has also shown a steady increase in the mean birth weight with increasing maternal stature.

The basic mechanisms of the relationship between low birth weight and poor environment, however, are not as yet well understood, and research is needed in this field of human reproductive physiology, which in the past has been largely neglected, particularly by obstetricians and paediatricians. There is welcome evidence that this position is being remedied now that scientific advances have made available new techniques. Assuming that it is possible for the vast majority of babies to be born with a birth weight consistent with full viability and health (this being dependent on an expected general amelioration in the environment of the maternal population), the Committee decided that it would be inappropriate now to propose changing the upper limit of prematurity in the international definition. In view of the convincing evidence that many of the babies included within the limits of the definition are not born prematurely, the Committee recommended that the concept of " prematurity " in the definition be replaced by that of " low birth weight ".

**Proposed lines of investigation**

To meet the need for new facts—in particular to discover the distribution of babies and the number of deaths by birth weight groups for all live births—the Committee proposed that birth registration should be as complete as possible and that as soon as practicable birth weight be entered in the official birth certificate used in each country. The necessity and value of uniformity in collection of information on births and deaths is emphasized; this would allow comparisons to be made both within countries and internationally. All countries and anyone (for example, in hospitals, domiciliary services, etc.) with interest in the statistical aspects of this subject should collect and study the birth

weights in 500 g weight groups, as follows: 0-1000, 1001-1500, 1501-2000, 2001-2500, 2501-3000, 3001-3500, 3501-4000, 4001-4500, 4501-5000, 5001 or more. The mortality rates for 24-hour, 48-hour, 7-day, 28-day, and one-year periods after birth should be determined.

**Avoidance of low-weight births**

Whatever the incidence of babies with low birth weight, it is universally accepted that the preventive aspects are the most important of any programme aimed at dealing with this problem. In the light of recent experience, it is believed that some preventive measures can be carried out by all countries, regardless of the level of their technological development or the extent of their health services. Pre-natal care and attention to diet for the pregnant woman, health education of the public, simple instruction for untrained traditional birth attendants (where appropriate), and careful supervision of complications in pregnancy may all be expected to have a considerable effect on the incidence of low-weight births.

**Care of low-weight babies**

Much importance is given in the report to the need for care of low-weight babies. It is to be expected that before special care is planned for low-weight babies all infants already receive good care. This in itself will have a highly beneficial effect on the survival of many low-weight babies, especially among those weighing between 2000 and 2500 g at birth. The availability of such care is likewise essential for the continued healthy development of low-weight babies who have received special care, if these are not to run the later risks of poor sanitation, a high incidence of malaria or other disease, lack of suitable provisions for immunization, etc., concomitant with a deficient public health programme.

Special care for babies of low weight does not necessarily mean incubator care. The needs of the majority of these infants can, in fact, be met through very simple means, both in the hospital and at home. Such simple care involves lower expenditure, and may be given to a great extent by less highly trained personnel than that required for more specialized care. It is based on the fundamental principles of providing the infant with extra heat if necessary, advising the mother on artificial feeding if breast feeding is not possible, and guarding against exposure of the infant to sources of infection.

Specialized care services involve the use of incubators or heated cots and specially trained personnel. They should be provided only if this can be done without neglecting health services of higher priority and if adequately trained personnel is available.

Whether low-weight infants are cared for in hospital or at home, follow-up services should be available for at least one year after birth.

**Organization of services**

Advising on the organization of services for low-weight babies—in particular in countries still undeveloped—the Committee stressed that before planning can be started the extent of the problem must be properly evaluated on a statistical basis, prevention should be a primary aim, inexpensive simple care should be initiated before anything more complex, and all aspects of the general problem should be considered in relation to the whole health service programme. National, regional or local advisory committees can play a useful role in advising government authorities and in stimulating interest in this special field.

# HEALTH STATISTICS *

National and local health administrations need statistics to organize and operate their health services. If there are no statistics, they operate in the dark. If statistics from routine sources are inadequate, special statistical surveys should be organized. A WHO Expert Committee on Health Statistics [1] that met in Geneva, from 5 to 10 December 1960, reviewed *inter alia* the aims, techniques, potentials and limitations of morbidity and health surveys.

A health survey is much more comprehensive than a morbidity survey. A general health survey can provide information on: (*a*) the health status of the population; (*b*) conditions influencing or influenced by health; (*c*) health services and medical care. Morbidity surveys cover only general morbidity or morbidity from one disease or group of diseases, both of which are included in (*a*).

A health or morbidity survey generally uses one or more of three principal sources of information: a household interview; medical examination to determine morbidity in general or the prevalence of a given disease; and existing health records, such as those of hospitals, dispensaries, general practitioners, and social security services.

The Committee considered that surveys of the interview type are of particular value in obtaining information not readily available otherwise about levels of general morbidity and the use of health services in relation to broad social, environmental and economic factors. They do not, however, provide accurate information on the incidence or prevalence of certain diseases.

Surveys based on special medical examinations are particularly suitable for the detection of specific diseases in a fairly small area. With proper sampling design and adequate resources, they may sometimes be carried out on a larger scale.

The usefulness of existing health records as a source of morbidity information will vary according to such factors as the purpose of the survey, the degree of co-ordination of the medical, hospital and other health services in the country concerned, the form in which record systems are kept, and the purposes for which they are kept. Surveys based on these records would be particularly applicable in countries where all health services are provided through a single integrated system. In quality, the data obtained by this method are superior to data derived from interview-type surveys, though probably inferior to data yielded by special medical examinations under controlled conditions. Since existing health records have not usually been designed for the specific purpose of supplying statistical data, their use in retrospective surveys may be severely limited. However, they may be valuable for obtaining certain general information such as total numbers of admissions or visits, numbers of days of incapacity, etc., and as the starting-point for surveys of the examination or interview type. The usefulness of surveys based on records is limited when the information cannot be related to a population of known size and characteristics, and greatly enhanced when it can.

The Committee discussed the value and uses of local health surveys, specific disease surveys, and surveys in less developed areas. Health surveys carried out in more or less circumscribed geographical areas may serve one or more of three main purposes: (*a*) to determine the incidence of disease in a defined community at special risk by reason of certain geographical, climatic, or industrial factors, e.g., to determine the incidence of respiratory disease in a mining community;

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* *Wld Hlth Org. techn. Rep. Ser.*, 1961, **218**.

[1] Members of the Committee: Mr F. F. Harris, Canada; Dr D. W. Horn, United Kingdom; Dr F. E. Linder, USA (Chairman); Dr W. P. D. Logan, England (Rapporteur); Dr S. C. Seal, India; Dr T. Soda, Japan (Vice-Chairman); Dr M. Vacek, Czechoslovakia. Representative of the United Nations: Miss Nora P. Powell. Secretariat: Dr M. Čakrtová, WHO; Dr M. Grais, WHO; Dr H. F. Helweg-Larsen, WHO Regional Office for South-East Asia; Dr E. F. Krohn, WHO Regional Office for Europe; Mr J. Nielsen, WHO; Dr B. Pirc, WHO (Secretary); Dr Ruth R. Puffer, WHO Regional Office for the Americas; Dr M. Sédeuilh, WHO Regional Office for Africa; Dr S. Swaroop, WHO.

(*b*) to take the place of a wider survey, the local area being carefully selected as representative of a much larger area; (*c*) to serve as a pilot study for a larger investigation. It is usually more practicable to take the family or household, rather than the individual, as the unit of investigation in local surveys.

The specific disease survey is designed to measure a particular health problem where its extent or nature is not precisely known. There is little point in carrying out a survey of this type unless there is at least the possibility of putting a control programme into effect. The method usually employed in a specific disease survey is that of medical examination of individuals, though in special circumstances it may be possible to use existing records as the source of information (e.g., in the investigation of cancer in a community with well-developed medical facilities).

In under-developed areas, medical facilities are usually scanty and the information to be derived from medical records even more so. Under these circumstances, surveys based on the medical examination of a representative sample of the population are the only means of acquiring accurate information on which to base measures for disease control. Refined sampling techniques are not usually applicable in these areas. The survey is carried out by a specially trained team headed by a doctor, and begins with a special census of the population of the selected area. The census serves to provide an accurate population denominator for the subsequent calculation of prevalence rates, is a check on any absenteeism that might falsify results, and ensures that no individual is examined more than once. The selected sample then undergoes medical examination, supported by such laboratory examinations as are necessary and possible in field conditions. These surveys should be followed up by control measures against one or more specific diseases, the survey teams being diverted to case-finding and treatment in the area in which they have been working. Surveys of this kind, followed by treatment campaigns, are of particular value in under-developed territories in that the personnel of the survey teams can, once the campaign is over, be used to develop rural health units and lay the foundations for a national health service.

The Committee recommended " that countries consider the advisability of supplementing existing health statistics by establishing health survey programmes based on modern scientific survey procedures adapted as appropriate to the area, taking into account the various types of surveys described in this report, their potentials and limitations, and the requirement that each survey be designed to meet a specific objective ".

The Committee also reviewed the preparatory work for the Eighth Revision of the International Classification of Diseases (ICD). Special efforts have been made to ascertain in which respects the ICD has failed to serve the needs of developing countries and in what ways it should be modified. The Committee noted the progress made in respect of the three sections specially in need of a comprehensive revision, i.e., cardiovascular diseases, causes of foetal death and of early neonatal mortality and morbidity, and mental disorders. A series of meetings concerned with the revision are scheduled to be held between 1961 and the actual revision conference in 1965.

The Committee reviewed the report of the UN/WHO Seminar on the Use of Vital and Health Statistics for Genetic and Radiation Studies (1960) and recommended that countries should take cognizance of the suggestions set out in the " Consensus of Opinion of the Experts participating in the Seminar ", which is reproduced as an annex to the Committee's own report. Other subjects discussed included the development of hospital statistics, the WHO statistical programme, and the activities of national committees on vital and health statistics.

# BIRDS AND THE SPREAD OF DISEASE

Ticks are dreaded vectors of pathogenic viruses and rickettsiae. The ability of many species to transmit and to harbour for long periods the causative organisms of various diseases, such as Q fever, some forms of typhus and relapsing fever, and several recently discovered virus infections, makes them suspect wherever they are found. Several species of ixodid ticks have a well-defined habitat. Thus *Hyalomma marginatum rufipes* occurs throughout the Ethiopian Faunal Region, including the highlands of south-western Arabia and scattered localities in the Nile Valley of Egypt. *Hyalomma marginatum marginatum*, on the other hand, occurs essentially in Europe and Asia.

In the last few years *H. marginatum rufipes* has been reported outside its normal habitat, and outbreaks of virus disease have been observed in areas hitherto free from it—the Kyasanur Forest disease of Mysore, India, for example, could have been brought in by ticks. How have these vectors reached parts of the world in which they had previously been unknown?

It has been suspected that migrating birds carry the ticks, and Hoogstraal et al., in a recent issue of the *Bulletin of the World Health Organization*,[1] show how well founded this suspicion is. Birds are already known to be hosts of several viruses pathogenic to man and domestic animals, and the part they play in spreading such viruses is all the greater if they harbour ticks as well.

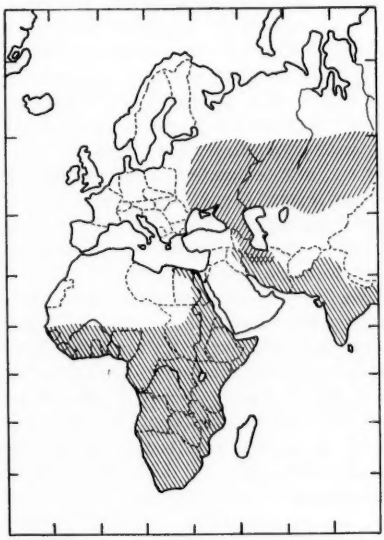
In or near Cairo, Hoogstraal and his co-workers have for several years trapped migrating birds flying in spring from tropical or southern Africa, in which they spend the winter, to Europe and Asia, in which they nest, and have examined them for ticks. While attached to birds, some species of ticks go through the stages of development from the larva to the nymph (a process taking from several weeks to several months); when they are adult, they detach themselves from their hosts. Consequently other stages than the immature are scarcely ever found among the ticks collected from birds. Some of the ticks harboured by birds escape examination, either because they have become detached or because, when mature, they have been eaten by the birds. Ticks of the genus *Hyalomma* are invariably found in, around, or near the ears of their host. With the exception of *Argas* and *Haemaphysalis*, which may attach themselves anywhere on the host, most species of ticks attach themselves to the head, so that it is seldom necessary to search for them elsewhere on the body. If the bird that is host to the ticks dies before the nymphs have completed feeding, they die at this stage of development or—provided they have imbibed enough blood to moult to the adult stage—develop frequently into dwarfs that may be difficult to identify. Well-formed adult ticks develop only from nymphs that have fed fully before their last moult.

From 1956 to 1960, 340 birds representing 22 species and subspecies were found to be carriers of 1025 immature ticks, all but 7 of which seemed to be *H. marginatum rufipes*. The authors give a detailed description of the results of the 1959 and 1960 trappings. In the course of the migration period of spring 1960, 959 birds bound for the north were trapped in nets or attracted by bait and examined. Among them 173 belonging to 16 species were free from ticks; of 786 belonging to 13 other species or subspecies, 128 harboured ticks, the percentage infested varying between 4.8 and 60. The birds included such species as harriers, kestrels, falcons, quails, pheasants, larks, thrushes, blackbirds and warblers. The maps opposite show the summer and winter range of certain species found to harbour ticks. It will now be easy to understand how *H. marginatum rufipes* succeeded in getting as far as the western desert of Transcaucasia and the mountain

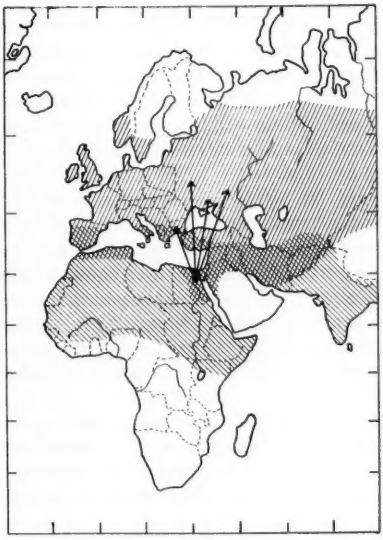
[1] Hoogstraal, H. et al. (1961) *Bull. Wld Hlth Org.*, **24**, 197.

WINTER AND SUMMER RANGE OF TICK HOSTS

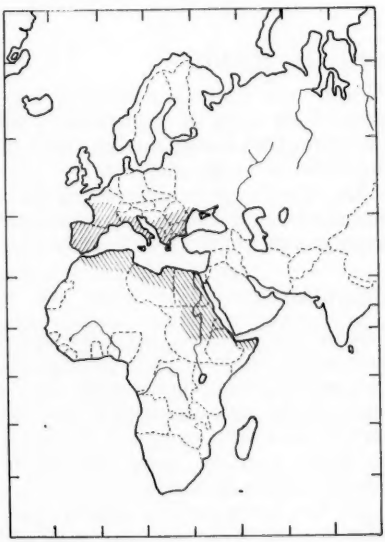
Pallid Harrier
(*Circus macrourus*)



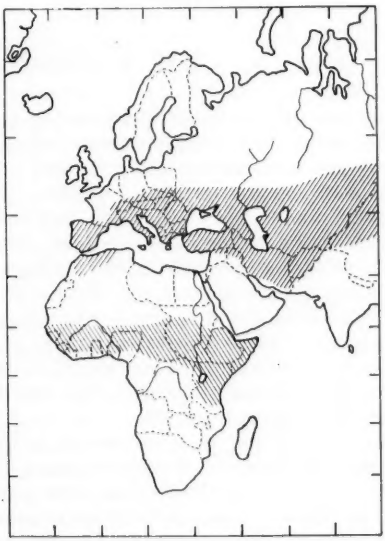
European Quail
(*Coturnix coturnix coturnix*)



Mediterranean Short-toed Lark
(*Calandrella cinerea brachydactyla*)



Rock Thrush
(*Monticola saxatilis*)



breeding  winter  ⟶ migration as determined by banding returns

pastures of Tadzhikistan, from which it has been reported.

In a parallel study recently published,[2] Hoogstraal & Kaiser describe a study made in the autumn of birds migrating from north to south, quitting Europe and Asia to winter in Africa. Out of 8379 birds examined, 7381 belonging to 28 species were infested with ticks, and 998 belonging to other species were free from ticks; 504 ticks were taken from 321 birds. Of these ticks, 15.08% were confirmed as being *H. marginatum marginatum*, while 48.21% belonged to the genus *Hyalomma* and were probably also *H. marginatum marginatum*. There seem to be intermediate forms between the subspecies *H. marginatum marginatum* and *H. marginatum rufipes* in areas where they both co-exist. As might be expected, therefore, the transport of ticks is a two-way traffic.

What diseases can these ticks carry? *H. marginatum rufipes* may be infected with *Rickettsia conorii*, the causative organism of boutonneuse fever or tick typhus in southern Africa. This disease, which is related to Rocky Mountain spotted fever of the American continent, is widely spread in Africa from the Cape to the Mediterranean. It also occurs in southern Europe as far north as Romania, and in the Crimea, Israel, and India. Its distribution thus corresponds closely to that of the vector ticks.

*H. marginatum marginatum* and *Haemaphysalis punctata*, found on birds returning to Africa, are associated with Crimean haemorrhagic fever, Q fever, tularaemia, tick typhus, and brucellosis. They are also vectors of a number of pathogenic organisms causing disease in domestic animals.

As the authors emphasize, these studies are only in their early stages. On the assumption that some 300 species of birds fly over Egypt in the course of their migrations, the examination of a mere 40 or so will provide only an approximate indication of the extent to which ticks are carried and disease spread. But the studies do serve to draw attention to the fundamental role migrating birds may play in the dissemination of tick-borne virus diseases.

[2] Hoogstraal, H. & Kaiser, M. N. (1961) *Science*, **133**, 277.

## THE PATHOGENESIS OF RABIES

How do the viruses of poliomyelitis and rabies invade the central nervous system (CNS) and cause the irreversible lesions that make these diseases so serious? During the past ten years, there has been extensive research on the pathogenesis of poliomyelitis, and two theories have been advanced. According to some authors, the virus invades the CNS *via* the blood stream during a stage of viraemia. Others believe that poliomyelitis virus first invades the peripheral nerves during the viraemic stage and then travels along the nerves to the CNS.

This research has aroused interest in the analogous problem of the pathogenesis of rabies, and recent work has shed some light on the subject. Like poliomyelitis virus, rabies virus can now be cultivated *in vitro* on non-nervous tissue. It has been found in parts of the body other than the CNS, but there have been few indications that it reaches the CNS *via* the blood stream.

The results of a reinvestigation of the pathogenesis of rabies are described in a recent number of the WHO Bulletin.[1]

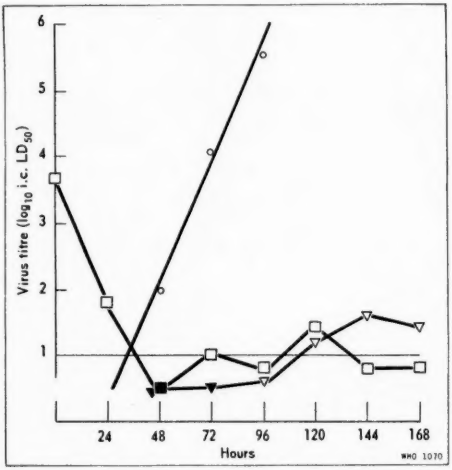
### Experiments

Mice were infected, some intramusculary with a fixed strain of virus (Pitman Moore), and others intracerebrally with street virus. Immediately after inoculation and then at varying intervals, groups of 10 mice were sacrificed and the virus content of the infected organs estimated.

As the accompanying graph shows, no virus is found in the muscular tissue 48 hours

[1] Schindler, R. (1961) *Bull. Wld Hlth Org.*, **25** (In press).

CONCENTRATION OF VIRUS IN MUSCULAR TISSUE AND IN SPINAL CORD AFTER AN INTRAMUSCULAR CHALLENGE WITH 100 000 $LD_{50}$ IN THE LEFT HIND LEG




*At the site of injection.*
*In the right hind leg.*
*In the spinal cord.*
*Virus not demonstrable.*

after intramuscular injection into the calf muscle of the left hind leg of the mouse, while by this time it has reached a concentration of 100 $LD_{50}$ in the spinal cord. At the end of 72 hours, the virus reappears at the site of injection, and after 96 hours it is present in the right calf. During this time, the concentration of the virus in the CNS continues to increase. After multiplying in the CNS, the virus travels to the peripheral organs: 48 hours after injection, it is in the CNS; it is demonstrable in the left sciatic nerve 24 hours later, in the right sciatic nerve after a further 24 hours, and in the nerves of the other limbs yet another 24 hours later.

A further experiment indicated that the virus also travels in the reverse direction, i.e., from the CNS to the periphery. In mice inoculated in the neck muscle, the incubation period was significantly shorter than in mice inoculated in the leg (175 hours as against 194 hours), which can be explained by the fact that the virus, travelling along the nerves, takes longer to travel from the leg to the brain than from the neck to the brain. Immediately after intracerebral challenge of 1600 $LD_{50}$, 32 $LD_{50}$ of the injected virus were found in the brain, but 6 hours later no virus could be found there. It was first demonstrated 30 hours after challenge and multiplied within the following 17 hours up to a titre of 1000 $LD_{50}$.

No viraemia was observed. Blood from the hearts of inoculated mice, including some that already showed symptoms of rabies, was free from virus. The problem was approached indirectly by carrying out protection tests with antirabies serum. Ten minutes after intracerebral injection of the virus, the protective power of the serum—also administered intracerebrally—rapidly diminishes. From this it may be concluded that the greater part of the virus injected combines with susceptible cells in the CNS to form a non-neutralizable complex. Furthermore, virus injected intracerebrally has lost its infective power 360 minutes later. This shows that in the meantime the virus has penetrated into the cells, and is undergoing an eclipse in which infectious particles break down into non-infectious smaller units. In muscular tissue, virus retains its infectivity longer and antirabies serum is protective for a greater length of time. Animals inoculated intramuscularly do not fall ill unless huge amounts of virus are administered. It may therefore be assumed that in muscular tissue the greater part of the virus has no opportunity to combine with and penetrate into susceptible cells.

## Conclusions

During incubation, there is an interval in which the virus is not demonstrable in either brain or muscle. After this interval and until the animal dies, the virus concentration is very low in muscular tissue, whereas it increases quickly within the CNS and soon reaches titres of $10^7 LD_{50}$. Moreover, the virus is demonstrable in muscular tissue only

after having multiplied and reached titres higher than 100 $LD_{50}$ in the CNS. It may be concluded that the virus does not multiply in muscular tissue and that its presence in other skeletal muscles in the later stages of incubation is the consequence of its multiplication in the CNS. Schindler cites the following observations in support of the theory that the virus travels along, or in, the nerves from the periphery to the CNS and *vice versa*:

1. The absence of virus in the blood stream during the incubation period.

2. The fact that the incubation period is shorter when the inoculation is performed in muscles near the CNS rather than in those at a distance.

3. The fact that virus can be found in the spinal cord earlier than in the brain following intramuscular injection into one hind leg.

4. The presence of virus in the peripheral nerves.

In the case of poliomyelitis induced traumatically (e.g., after tonsillectomy or intramuscular injection), the majority of investigators presume that the virus travels along the nerves. While trauma is exceptional in poliomyelitis, it is the rule in rabies, which is almost exclusively transmitted by the bites of animals. Thus, with due reservations, it is possible to point to a certain similarity in the pathogenesis of the two diseases.

# *Epidemiological and Statistical Information*

## Is influenza declining?

Few diseases have given rise to so many theories as influenza. Was it the disease described in past centuries as arising explosively, spreading rapidly, and affecting a large number of people but causing few deaths ? Was it the Sweating Sickness or English Sweat of Tudor times in England, or the Picardy Sweat of France ? Why should influenza have declined between 1860 and 1889 to almost nil, then suddenly increase to such an extent that even now, when it appears to be waning again, it still has a mortality far above what it had in those years ? Why should the pandemic of 1918-1919 have been one of the most lethal ever ? Where does the influenza virus go during the periods between epidemics ? Why does the disease attack the old in one epidemic, the young in another ?

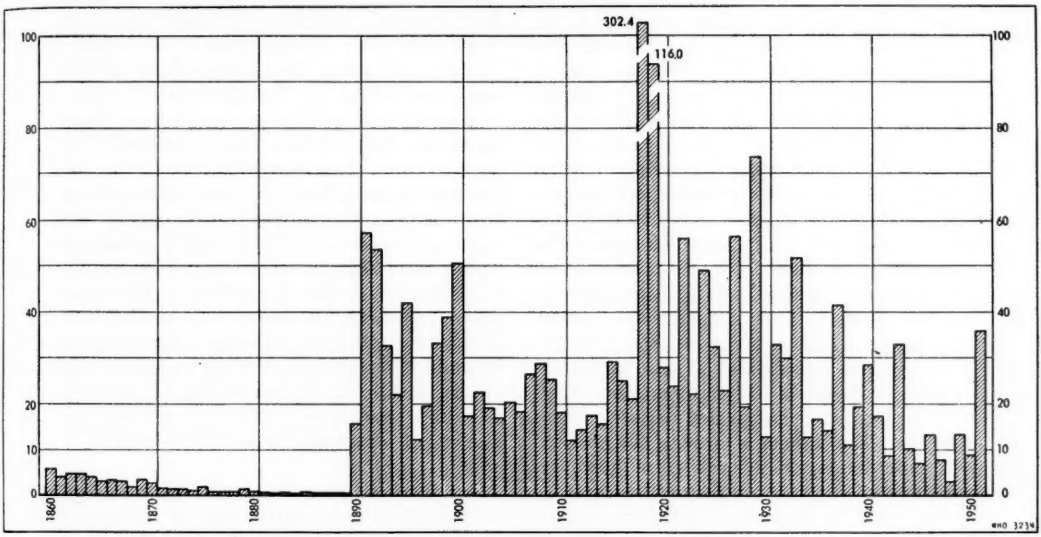
Is influenza really declining ? A recent WHO *Epidemiological and Vital Statistics Report* [1] gives the number of deaths and the death rates per 100 000 population in 13 countries for the years 1921-1958, and the general impression is of an irregular curve tending downwards. But a glance at the annual death rate in England and Wales for the period 1860-1951 (see figure) will show how difficult it is to make any prognostications about the future of influenza. Between 1880 and 1890 any unbiased observer would have concluded that influenza was on the point of disappearing completely; and the course it was to take from 1890 on would have been a great surprise to him. On the basis of even present-day knowledge about influenza, too, could anyone have guessed that the 1918-1919 pandemic would have ravaged not only the countries engaged in the First World War but also every other country in the world (except, it seems, St Helena, which no doubt owed its immunity to its great remoteness) and taken more lives than did the War itself ?

After 1929 the general trend is downwards, and even the epidemic of Asian influenza, one of the best documented of epidemics,[2] killed relatively few people. In England and Wales,

[1] *Epidem. vital Statist. Rep.*, 1960, **13**, 531.

[2] See *Bull. Wld Hlth Org.*, 1959, **20**, 183.

DEATH-RATES PER 100 000 POPULATION FROM INFLUENZA IN ENGLAND AND WALES, 1860-1951




however, this epidemic had another distinction besides that of being the first caused by the Asian strain of the virus; [3] although the mortality was low, there was a very high incidence among children and young adults, and the death rate at ages under 44 was the highest since the 1918-1919 pandemic. In that pandemic, there had been three waves. In the first, in June-July 1918, the attack rate was high, the severity of the disease low; in the second, in October-November 1918, the severity was great, the young were attacked rather than the elderly, and there appeared the much discussed phenomenon of heliotrope cyanosis; in the third, in February 1919, the disease was still severe, but the young were less affected than the elderly and old.

Lack of knowledge makes it impossible to do more than speculate about many of the past manifestations of influenza. The disease did not even acquire its present name till the middle of the eighteenth century.[4] Nor was the causative virus of human influenza discovered till 1933, when it was isolated from cases by Smith, Andrewes & Laidlaw,[5] who also found neutralizing antibodies to the virus in convalescent sera. Since this discovery, more and more information about the virus of influenza has been acquired. There are now known to be three immunologically distinct serological types, A, B, and C. Types A and B comprise numerous variant strains, which tend to group themselves into serological families. The virus responsible for swine influenza belongs to Type A. Minor antigenic changes have occurred from year to year in Type A viruses since 1933 but, at intervals of roughly ten years, markedly different antigenic strains have appeared and thereafter predominated. The first change of this kind was in 1946-47, when the A1 virus

[3] It may not in fact have been the first epidemic caused by the Asian strain, since antibodies against this strain have been found in persons of 70 and over.

[4] The name apparently comes from the Italian *un influenza del freddo*, thought to cause the disease.

[5] Smith, W., Andrewes, C. H. & Laidlaw, P. P. (1933) *Lancet*, **2**, 66.

(often called influenza A-prime) appeared. Against this virus vaccines prepared from previous strains were of no effect. A second change occurred in 1957, when the A2 or Asian virus appeared, causing a pandemic. Antigenic changes have also been observed in Type B virus, but they are less sharply defined. Type C viruses have shown no detectable variation.

Does the variability of the influenza virus explain the course of influenza epidemics ? Immunity to the disease is certainly short-lived. The theory has been advanced that some kind of resistance to influenza antigens is established by attacks of the disease. The virus responds by antigenic variation, producing antigens against areas of antibody deficiency in the population, so that epidemics continue, caused by different strains. Antibodies are then elaborated against these antigens. The influenza virus is not credited with infinite powers of variation, however; in due course there is a return of the cycle, as is shown by the presence of antibodies against the Asian strain of virus in the sera of old persons. By that time there are new generations of individuals against whom the virus is effective.[6]

The WHO Expert Committee on Respiratory Virus Diseases advanced three possible explanations for the origin of these antigenic changes in the influenza virus.[7] Antigenic variation may be expected to occur in any virus population, the driving forces of variation and immunological selection altering the relative preponderance of existing antigenic components, so that antigens important in strains of a previous period and relegated to a minor position may re-emerge into prominence. Alternatively, mutation may bring about the appearance of an antigen or antigens not previously present. Thirdly, there may have been or be a human or animal reservoir of virus.

This third alternative leads to the question of what happens to the influenza virus during periods of relative quiescence of the disease. Does the influenza virus retreat to some animal reservoir when there is no epidemic among human beings, to issue forth periodically when circumstances are favourable and sweep round the world? The first influenza virus isolated (by Shope) was from swine in the USA, and viruses akin to human influenza viruses have been recovered from swine in Great Britain. The Sendai virus (haemagglutinating virus of Japan) has been found in that country to be endemic in pigs, guinea-pigs, hamsters and mice, and a definite outbreak of influenza with a similar virus occurred in Vladivostok in 1956 and in Moscow later in the same year. Kaplan & Payne [8] point out that any valid theory of what happens must take the animal influenzas into account as part of the natural history of the disease. But it must be admitted—they add—that relatively little is known of naturally occurring influenza in animals.

Another theory has been advanced by Andrewes for the reappearance of the virus.[9] He rejects the view that the virus flits from country to country, returning to its starting-point some time later and setting off another epidemic when the population has lost its resistance. This, he maintains, cannot be upheld because it is very difficult to find influenza anywhere for long periods; even if one imagines an annual swing between the northern and southern hemispheres, it has to be remembered that influenza A does not break out in Europe every winter. His suggestion is that between outbreaks influenza can go underground, either in chronic lung lesions in man or in some form unidentifiable by the standard tests.

The influenza virus is known to undergo a kind of latent phase in epidemics. On some occasions there have been early summer " flurries " preceding a widespread autumn epidemic caused by the same antigenic strain. In others, the infection, known to have been imported into an area, has appeared to lie dormant for a while before

[6] Rivers, T. M. & Horsfall, F. L. ed. (1959) *Viral and rickettsial infections of man*, Philadelphia, Lippincott, p. 660.

[7] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **170**, 8.

[8] Kaplan, M. M. & Payne, A. M.-M. (1959) *Bull. Wld Hlth Org.*, **20**, 481.

[9] Andrewes, C. H. (1954) *Epidemiology of influenza*. In: *Influenza : a review of current research*, Geneva, p. 9 (*World Health Organization : Monograph Series*, No. 20).

suddenly bursting out into a full-fledged epidemic, often arising from multiple centres. Equally, of course, it has pursued an epidemic course at times from the moment of its introduction, presumably because conditions have been suitable.

Can any conclusion be drawn from present trends in influenza mortality, as shown in the *Epidemiological and Vital Statistics Report*? Very little, it would appear. The downward trend in mortality may well be due to the success of the sulfonamides and antibiotics in controlling the complications; for it must be remembered that while influenza morbidity is very high, influenza mortality is very low, and the decline in mortality does not mean that morbidity is also declining *pari passu*. It may also be possible that present-day strains of the influenza virus are relatively less virulent than those of past periods. That they will continue to be less virulent no one knows; with a virus as versatile as the influenza virus is antigenically, it may be surmised that the only certainty about the future of influenza is that it will be uncertain. Indeed, the mortality from influenza in England and Wales—to use the same country as before—for the first eleven weeks of 1961 [10] shows an upward turn: 6245 deaths have been registered, which is nearly as many already as occurred during the pandemic of Asian influenza of 1957 (6716 for the whole of the year).

[10] *Brit. med. J.*, 1961, 1, 1050.

## Smallpox in 1960

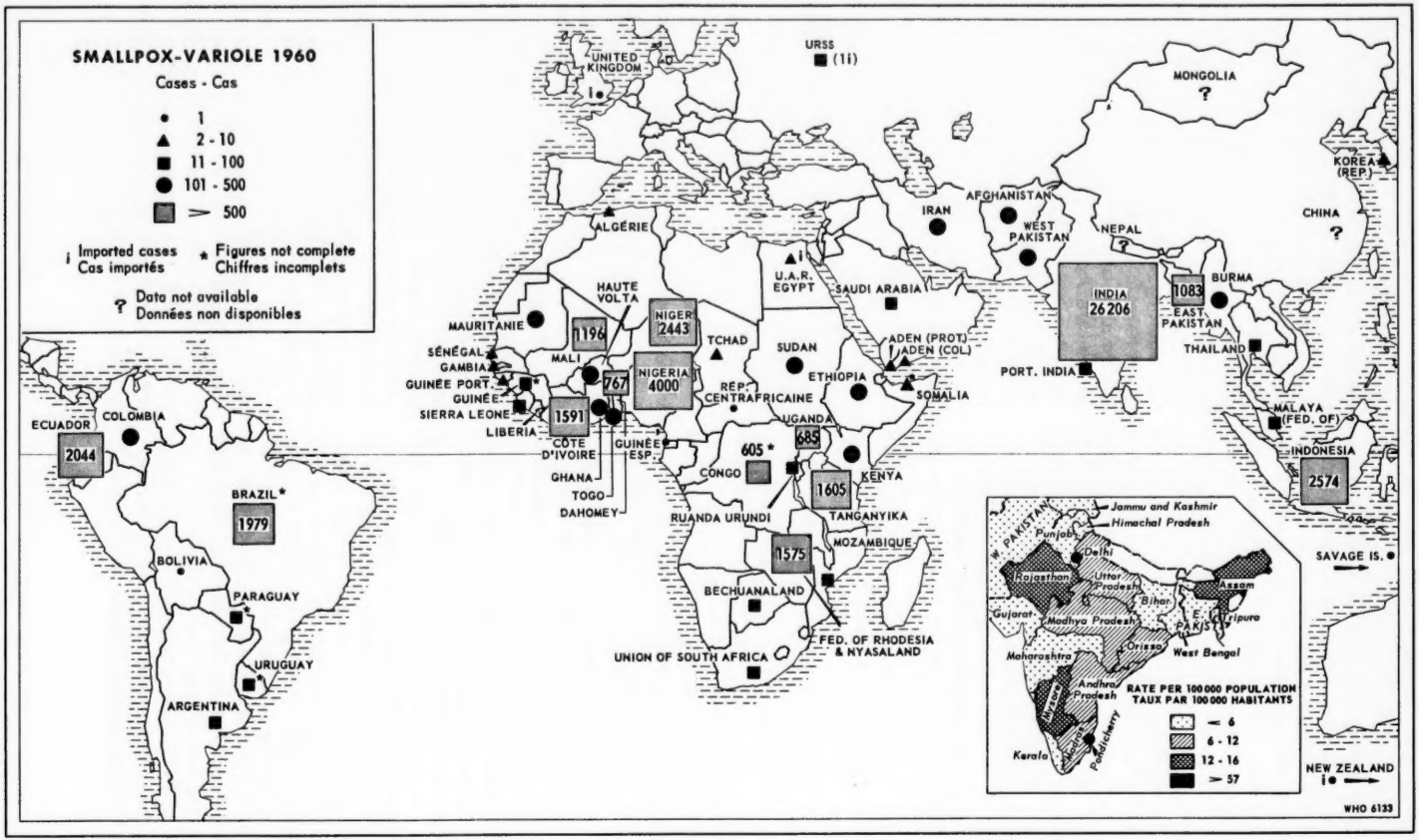
The number of smallpox cases recorded throughout the world in 1960 was hardly more than 51 000, it is stated in a recent number of the WHO *Weekly Epidemiological Record* (No. 16, 1961). While this figure is distinctly lower than that for any previous year, it must be stressed that it is not yet final, since for some countries the data received are incomplete, while for a small number no figures at all are available.

The decrease of about 23 000 cases as compared with 1959 is attributable almost entirely to the improvement of the situation in East Pakistan and India, where some 27 000 cases were notified in 1960 as against 49 500 in 1959. Although smallpox appears to be declining in these countries, it should not be forgotten that they are subject to epidemic outbreaks of the disease every few years, the last having been in 1958.

No cases at all were reported in some other countries and territories (Angola, Basutoland, Cambodia, Iraq, Qatar, and Viet-Nam), where a few cases were observed in previous years. It would, however, be premature to conclude that the disease has been eradicated from these countries and territories until after an observation period of several years.

In 1960 many towns near ports or airports reported cases of smallpox, which remains one of the rare quarantinable diseases likely to be transmitted from one country to another by sea or air traffic. The most notable instances of this in 1960 were the export of the disease by sea from Calcutta and the Persian Gulf to Suez, and by air from India to Great Britain and also to Moscow, where a small epidemic resulted.

The long incubation period of the disease, the slightness of the symptoms at times (especially in persons who have been vaccinated years before), the increasing speed of aircraft, and the growing number of air travellers combine to make the transport of smallpox by air increasingly frequent.


SMALLPOX-VARIOLE 1960
Cases - Cas
1
2 - 10
11 - 100
101 - 500
> 500
Imported cases
Cas importés
Figures not complete
Chiffres incomplets
Data not available
Données non disponibles
URSS (11)
UNITED KINGDOM
MONGOLIA
KOREA (REP.)
CHINA
AFGHANISTAN
IRAN
WEST PAKISTAN
NEPAL
ALGÉRIE
U.A.R. EGYPT
SAUDI ARABIA
INDIA 26206
1083
BURMA
EAST PAKISTAN
THAILAND
PORT. INDIA
HAUTE VOLTA
NIGER 2443
MAURITANIE
1196
SÉNÉGAL
GAMBIA
MALI
TCHAD
SUDAN
ADEN (PROT.)
ADEN (COL.)
GUINÉE PORT.
767
NIGERIA 4000
ETHIOPIA
SOMALIA
GUINÉE
SIERRA LEONE
LIBERIA
1591
RÉP. CENTRAFRICAINE
UGANDA
688
CÔTE D'IVOIRE
GUINÉE ESP.
GHANA
TOGO
DAHOMEY
605 *
CONGO
KENYA
1605
TANGANYIKA
RUANDA URUNDI
MOZAMBIQUE
1575
BECHUANALAND
FED. OF RHODESIA & NYASALAND
UNION OF SOUTH AFRICA
ECUADOR
2044
COLOMBIA
BRAZIL*
1979
BOLIVIA
PARAGUAY
URUGUAY
ARGENTINA
MALAYA (FED. OF)
INDONESIA
2574
SAVAGE IS.
NEW ZEALAND
W. PAKISTAN
Jammu and Kashmir
Himachal Pradesh
Punjab
Delhi
Rajasthan
Uttar Pradesh
Assam
Bihar
Gujarat
Madhya Pradesh
E. PAKISTAN
Tripura
Orissa
West Bengal
Maharashtra
Andhra Pradesh
Mysore
Madras
Kerala
Pondicherry
RATE PER 100 000 POPULATION
TAUX PAR 100 000 HABITANTS
< 6
6 - 12
12 - 16
> 57
WHO 6133

CASES OF YELLOW FEVER NOTIFIED IN 1960 *

* The case at Irituia, Brazil, was in a monkey.

## Yellow fever in 1960

Despite the continual increase in international traffic in 1960, yellow fever remained confined in its usual foci in Africa and America, according to a recent number of the WHO *Weekly Epidemiological Record* (No. 11, 1961).

In Africa, apart from occasional epidemics in Ethiopia and the Sudan, the cases notified each year are nearly always in the Republic of the Congo (Leopoldville) and appear for the most part to be due to jungle yellow fever. The 1960 figures for this country are appa-

rently incomplete. They mention 7 cases only: 2 in the Stanleyville district and 5 in the Eastern Province.

In America, a high proportion of the cases notified come from Bolivia—30 in 1960, out of 47 for the whole continent. There were 10 cases in Colombia, 4 in Peru (data incomplete), and 2 in Venezuela. In Brazil, 1 human case was reported, and the yellow fever virus was isolated from a monkey 200 km south of Belem.

There was no evidence of activity of the virus in other Central and South American countries and territories (British Honduras, Guatemala, Panama, and Trinidad) where the disease had been notified during the previous five years.

# *Health Legislation*

## Advertising of pharmaceutical preparations

Throughout the world the number of pharmaceutical specialities is rapidly increasing and there is a corresponding increase in pharmaceutical advertising. Many new media, such as television, have been pressed into service for this purpose. All this entails certain risks for the general public, who are exposed to the dangers of self-medication and who may be induced to apply persuasion to their doctors to prescribe. Public advertising may make exaggerated claims, excite unnecessary alarm, or falsely reassure and so delay needed treatment. " Technical advertising ", i.e., advertising to the medical profession, has grown in some countries into a massive and intrusive pressure against which the doctor cannot always adequately defend himself.

Many of the larger pharmaceutical firms voluntarily adhere to high standards of advertising ethics through codes drawn up by their trade associations, sometimes in conjunction with the advertising authorities. But it is obvious that firm supporting legislation is essential if the public interests are to be properly protected. On a number of occasions international bodies have stressed this need. In 1959, the eleventh session of the WHO Regional Committee for the Americas recommended that the governments of member countries of the Pan American Health Organization should take steps to prohibit untruthful and misleading advertisements. More recently, the International Pharmaceutical Industry Group of the member countries of the European Economic Community expressed the wish that advertising to the public should be subjected to control to prevent harm or misuse, especially when the public might be misled or induced to ignore timely medical advice. A number of countries are at present revising or planning regulations in this sphere. An analysis of existing legislation in 22 countries just published in the WHO *International Digest of Health Legislation* [1] usefully complements an earlier review [2] of the classification of pharmaceutical products.

Some idea of the size of the problem is apparent from the sheer number of the preparations concerned: 3500 for Sweden, over 25 000 in Canada, 40 000 or more in a few countries. It is not difficult for legislation to control the advertising of drugs in countries where they are few in number, but is not so easy in those where there are thousands of products on the market. Many of these substances depend for their sale not at all on intrinsic merits but almost entirely on the sheer volume of advertising; while safe and effective products of long standing, well known by reputation, may require little boosting.

The object of legislation designed to control

[1] See *Int. Dig. Hlth Legis.*, 1961, **12**, 1. This study is also available in pamphlet form (price: 3/6, $0.60, or Sw. fr. 2.—.).

[2] *Int. Dig. Hlth Legis.*, 1960, **11**, 5.

the composition of pharmaceuticals differs from that of legislation aimed at governing the way they are advertised. It is not enough to ensure that a product is innocuous and effective if it is promoted in such a way as to create alarm and despondency or to encourage excessive self-medication. Even quite common pharmaceuticals, taken too often, will cause ill effects; and it is largely due to advertising influence that tranquillizers and nervous stimulants have been sold directly to the public on a large scale in western Europe and the USA in recent years. The claims made for these have been often frivolous, the hazards glossed over or left unmentioned. In 1947, the Pharmaceutical Society of Great Britain reported to the Ministry of Health [3] on the exaggerated and sometimes fraudulent claims being made, the harm done in causing the public to postpone seeking medical advice, the general impairment of healthy relations between public and doctors and the pseudo-scientific nature of the advertising copy. It seems undeniable, even today, that the volume of advertising for proprietary medicines is out of all proportion to their value to the community.

There is no doubt, however, that standards of pharmaceutical advertising have improved in recent years, thanks largely to legislative effort. Before 1941 legislation dealing specifically with advertising did not exist in the majority of countries and this is still the case in, for example, Belgium and the Netherlands. Special laws do exist in Argentina, the Dominican Republic, France, Germany (Federal Republic), Greece, India, Ireland, Peru, Poland and Spain; but all these laws came into being only during the last twenty years. Italy is still in process of recasting existing legislation. A general feature of such measures is the very close control of the direct approach to the public, and some countries, such as Denmark, France, and the United Kingdom, specify in great legislative detail what is to be understood as an advertisement so as to leave no loopholes. In some cases it is compulsory for promoting companies to apply for registration or the supply of a sales permit for each new product, and use may be made of the conditions of registration to control the advertising matter concerned. Registration or permits are required in Austria, Brazil, Colombia, Denmark, France, Greece, Luxembourg, Poland, and Switzerland. Most national regulations prohibit the advertising of drugs which are available only on medical prescription; and in many countries advertisements containing references to specified diseases such as venereal infections, tuberculosis and cancer are forbidden. It is also common for fallacious claims regarding the composition and effects of products to be made illegal. Secret remedies are frequently, but not universally, prohibited and in many countries it is required that the analysis of the product be printed on the wrapper. In some countries, such as Denmark and Italy, control extends widely outside the purely pharmaceutical field to include dietetic products, infant foods, dressings and surgical appliances. There is, of course, a wide range of detailed prohibitions which may be applied legislatively and the stringency of control differs from one country to another. Some of the methods which are forbidden include: advising treatment independently of medical advice; arousing alarm in the public; claims of infallibility; the offer of samples or of money back if unsatisfied; the use of photographs and testimonials from patients; and the use of expressions indicative of medical support. While, in most countries, the authorities confine themselves to seeing that the regulations governing prohibitions are not infringed, there are some—Denmark, the Dominican Republic, France, Luxembourg, Peru, Poland and Spain—where the whole of the advertising material must be submitted for direct censorship and approval.

In contrast with this generally stringent control over advertising to the public, "technical" advertising to doctors, dentists and members of allied professions is usually left unrestricted in the belief, presumably, that those at whom it is aimed are sufficiently expert and well informed to guard themselves against misrepresentation. But is this always

[3] *Pharm. J.*, 1947, **158**, 333.

so, particularly under present-day conditions when busy practitioners can barely keep abreast of the flood of new products? C. A. Morrell points out, in a memorandum to the WHO Expert Advisory Panel on the International Pharmacopoeia,[4] that doctors may sometimes be as vulnerable as patients to high-pressure salesmanship. Possibly for this reason certain countries exercise some degree of control over this form of advertising, and in Turkey all such material must be submitted for censorship to the Ministry of Health.

The survey published in the Digest covers legislation in the following countries: Argentina, Austria, Brazil, Canada, Colombia, Denmark, Dominican Republic, France, German Federal Republic, Greece, India, Ireland, Italy, Japan, Luxembourg, Peru, Poland, Spain, Switzerland, United Kingdom, USA and Yugoslavia.

[4] Unpublished working document WHO/Pharm/Exa/42.

# *Notes and News*

## Sanitation scheme for Greater Calcutta

Water supply and sewage disposal are urgent problems in many countries. The guidance that WHO can provide in this field is illustrated by the report of four consultants [1] assigned by the Organization, at the request of the Indian Government, to study measures to improve the water supply and drainage of Calcutta and the surrounding densely populated areas. They were also asked to study the public health implications of the present deficiencies in sanitary facilities and of the measures proposed as well as the technical, administrative and financial effects of such measures.

Calcutta, the capital of the State of West Bengal, is situated on the Hooghly River at the western side of the delta of the Ganges. Greater Calcutta covers some 30 municipalities scattered along either side of the Hooghly River for some 40 miles upstream from Calcutta, with a population of over 5 000 000, i.e., a density of more than 18 000 per square mile. The delta of the Ganges is a focus of endemic cholera, which periodically assumes epidemic form, as in the year 1958 when some 4900 cases and 1756 deaths occurred in Calcutta alone. The centre of this endemic focus is the Greater Calcutta area. Besides cholera, many gastro-intestinal diseases occur endemically.

Three different water supply systems are used in Calcutta: wells, mostly shallow; an older system for the supply of unfiltered water; and a more recent system for the supply of filtered water. For many reasons the sanitary situation is highly unsatisfactory. Most of the wells are not bored but surface dug, often in the vicinity of latrines and so easily contaminated by storm water. In 1959, 16 samples of water from shallow wells in a cholera area were examined and 2 of the samples were found to contain cholera vibrios. The water supply systems are also very inadequate, for several reasons: the older system, which feeds a fair number of stand pipes and provides a sufficient quantity of water, supplies only unfiltered water pumped from the grossly polluted river front. Most people find it easier to use this system rather than the recent system, which supplies filtered water, but only intermittently at certain times of day because of a fall in pressure. Out of every 25 families, 10 have to go more than 100 yards every time they want to fetch drinking water. As a result, many families store reserve supplies in easily contaminated containers. In many cases, whole families simply use water from surface water courses, not only for washing but also for cooking, and even for drinking.

Not only is the filtered water supply inadequate, but the sewage disposal system is also very unsatisfactory: in Calcutta itself over a million people are without any sewer facilities, and their latrines are not emptied regularly. It requires

[1] See *WHO Chronicle*, 1959, **13**, 461.

little effort of the imagination to realize that in a hot country and in the presence of organic refuse there is bound to be an enormous multiplication of flies. This plays an important part in the spread of cholera and other gastro-intestinal diseases.

The lack of a proper system for storm-water drainage—apart from the danger of flooding—means that the water can come into contact with latrines and then go on to contaminate shallow wells or the surface water of rivers.

Faced with this very unsatisfactory situation, the consultant team suggested first of all a number of steps to be taken immediately, namely, the provision of safe water in ample quantity to all persons by the rapid extension of the system of filtered water or tube-wells in all areas where they are not now provided; the immediate extension of sewers into all unsewered areas, and the elimination of service privies and other excreta disposal procedures; the provision of maximum storm-water drainage facilities; and, finally, the prompt exploration of geological strata for underground water, proposals for such exploration having been made for decades and money being available for the purpose. As a long-term project, the WHO consultants considered that the filtered water supply would have to be improved so that by 1981 an average of 330 million gallons per day would be available to the population. This step is the most important action in the entire programme if filtered water is to be supplied regularly 24 hours a day. At the same time the unfiltered water supply will have to be eliminated entirely. The early safeguarding of the Hooghly River as a continuing source of filtered water for the Greater Calcutta area is essential. This river has shown an alarming increase in salinity, which will increase still further if the Hooghly does not receive more fresh water discharges from other sources in dry months. The Government of India is advised to give the highest priority to this problem, because the Hooghly River is the "lifeline" of the whole of the population of Greater Calcutta.

The rapid and constant development of Calcutta, which may become one of the most important ports in the world, depends on improvement of the water supply and the sewerage and drainage systems. No great city can do without these facilities.

## Water pollution problems in Europe

Although national programmes of water pollution control have existed in a number of European countries for many years, more active co-operation between countries is needed to deal with the increasing pollution of Europe's international waterways.

A Conference on Water Pollution Problems in Europe was held in Geneva, from 22 February to 3 March 1961, under the joint auspices of the United Nations Economic Commission for Europe (ECE), the United Nations Food and Agriculture Organization (FAO), the International Atomic Energy Agency (IAEA), and WHO. The Conference considered that methods for the treatment of sewage and industrial effluents should be improved and their cost reduced. It is particularly important that research be pursued on the problems connected with the treatment of sewage sludge, the residues of synthetic detergents, cellulose pulp waste, other industrial wastes, and radioactive wastes.

Existing international treaties or agreements for the control of water pollution in Europe were discussed. General international administrative arrangements cannot always provide a solution to particular problems because of the great diversity of national legal and economic systems. It was suggested that international co-operation in this field would be most successful among riparian countries, and that exchanges of views among these and in legal, economic, and technical expert panels should be continued, with the assistance of the appropriate international agencies.

The study of drainage areas by the members of the Conference disclosed that there has been a considerable development in the practice of classifying rivers according to the quality of the water. The basis of this classification may be either the existing conditions, as shown by surveys, or the use to which the river is put. To be useful, the classification should be related to indices of pollution or to tolerance and limits of quality as established in the light of those indices. Until there is international agreement on indices and limits, it seems premature to recommend that all rivers be classified. Nevertheless, as some countries have found an official system of classification

to be helpful, there is clearly scope for international collaboration on the matter through exchanges of information and experience.

The Conference noted that there is as yet no general convention defining in detail the rights and obligations of States in connexion with the pollution of fresh waters. The view was expressed that the interested international organizations should continue their studies in this field, in co-operation or consultation with bodies concerned with codifying international river law.

It was the opinion of the Conference that the economics of water pollution should be treated in the broader context of the use of water resources in such a way as to permit the maximum benefit to the community from the public funds invested. Thus, the funds may be used for the prevention of water pollution, or for the purification of water to make it suitable for re-use. On the other hand, these measures may be purposely neglected, if it is estimated that they will be more costly than the economic damage caused by pollution.

The Conference endorsed the opinion expressed at the fourteenth session of ECE that international river control bodies should be set up for drainage areas where the degree of existing pollution makes them desirable. There was no general support for the establishment of control organizations with far-reaching powers, most experts favouring the view that the States concerned in a particular basin should try to solve pollution problems by means of bilateral or multilateral agreements providing for advisory bodies and appropriate administrative machinery. It was noted that a great number of countries have already entered into such agreements, but that very few of these agreements could be considered as international instruments in the true sense. As yet, no agreement provides for more than periodic investigations of certain water courses.

The Conference considered that the ECE has a useful and necessary role to play in furthering exchanges of information and experience in matters of water pollution control. It was suggested that study groups and small meetings of experts be held from time to time to discuss specific water pollution problems of common and urgent concern, and also that a further conference be held in several years' time to review the work of these groups and meetings as well as progress in water pollution control during the intervening period. Other measures suggested by participants included: a comparative review of certain technical, economic, administrative and legal questions; the establishment of an advisory service which would supply the names of experts in, and publications on, water pollution; the preparation of educational material; greater aid in the training of experts and the exchange of specialists; greater dissemination of information on new methods for the appraisal of water-use projects; and the systematic collection of cost data concerning operations for the prevention or abatement of water pollution.

## Records of illness

One of the great obstacles to planning for health is ignorance. Everyone agrees that plans for the health of an area must be based on knowledge of conditions in the area and the health history of the people who live in it; but this knowledge is all too often lacking. A man falls sick, goes to a doctor, is sent to a hospital, and returns cured to his home. The record of his illness is filed away by the doctor or the hospital, while the man himself disappears from sight until another illness takes him to the same or another doctor, the same or another hospital. There may have been a notification of his illness: another record is made, this time in the medical officer of health's office. His family may go to other doctors, and their illnesses may take them to other hospitals. Knowledge of the family background may not exist anywhere, or the family doctor may have it—but if he has, he probably has it in his head alone, and when he dies his knowledge may go with him and his successor have to build it up again. In the less developed countries doctors are too few and illness often goes unrecorded; but even in the more developed countries it may still be unrevealed, because the person who is ill cannot afford to pay the doctor's fees, or has a morbid fear of seeking treatment, or suffers from some other inhibition that keeps him away from doctor or hospital.

How can this situation be remedied so that records of the illnesses in a family and of the family's changing circumstances are not lost or scattered among general practitioners, hospitals, and public health offices? An attempt at a solu-

tion is about to be made by the health administration of the City of Zagreb, Yugoslavia.[1] Integrated medicine is practised in this city of over 600 000 inhabitants; one administration controls all preventive, curative, and other aspects. There is no private practice, a network of institutions catering for all the health needs of the population. The new system now to be introduced will mean that each individual will have his own personal health identity number, personal record card, and medical history card. A family folder will contain the basic data on each member of the family, the family history, and a description of the family's social and economic situation (including housing, sanitation, etc.). The personal record card will contain information on each person's occupation, the health insurance he pays, his blood group, the vaccinations and X-rays he has had, his blood pressure, his allergic status, his consumption of alcohol, the amount he smokes, etc.

This system will enable the incidence and prevalence of disease to be ascertained, make it much easier to follow a patient up, and give a picture of days lost from illness and of length of treatment. With the statistics it will make possible, the planning of health in Zagreb can be put on a rational basis.

## A health study in Yugoslavia

In 1957 the School of Public Health, Zagreb, Yugoslavia, conducted an inquiry into the health, living conditions and social and economic problems of the 880 inhabitants of 11 mountainous villages in the Velebit highlands above the Adriatic coast. These villages have no roads, no electricity, no wireless, no newspapers; the region in which they lie has no developed agriculture or cattle breeding, no industry, no mining. Life is just as it was fifty years ago—simple and hard; perhaps harder, since goat-raising is now forbidden, and the trade in wood, wool, and cattle that used to be carried on along the coast has fallen into decay. The young people of the villages can no longer emigrate to America as they used to, but they try to get away to other parts of the country where conditions are easier.

This situation has left a deep mark on the villages. Since 1900 the population has gone down. In 1900 there were 94 women to 100 men, in 1953 there were 112. The average age of the population has gone up, the percentage of people aged 65 and over increasing from 4.4% in 1900 to 11.1% in 1953, the percentage of children aged 0-14 decreasing from 43.1% to 32.6% in the same period.

Infectious diseases accounted for 46.5% of deaths at the end of last century. Now they have almost ceased to be a cause of death, the chief causes for 1953-57 being: from infant diseases 35.9%, from old age 33.3%, and from pneumonia 10.3%. Infant mortality has always been a serious problem. Cancer and cardiovascular diseases have been responsible for very few deaths.

The majority of cases of respiratory disease found in the investigation lay on the borderline between the pathological and the physiological. Diseases of the digestive tract were strikingly low, perhaps because of a diet containing much milk. The nutritional status of the villagers was good. The intestinal parasites found were similar to those of neighbouring districts. Syphilis was diagnosed in only two villagers. Investigation for antibodies to the polioviruses showed that contact with the viruses and immunity to them must have occurred in early childhood. Antibodies against Q-fever were found in 26.4% of people —not surprisingly, as the villagers live in close contact with sheep.

This health study was carried out by teachers and students of the School of Public Health,[1] and, apart from the knowledge it gave of conditions in a remote area, it brought the students into contact with the life of the villagers, taught them public health techniques such as analytical methods and sampling, and afforded them an opportunity to develop into research-minded workers. It showed that collaboration between university institutions and public health services can be of benefit to both. It also showed that much valuable information can be gleaned in a short time by a study such as this and used by the public health authorities as a basis for their health programmes.

[1] This system is described in an unpublished working document (WHO/Res. PHA/6) prepared by Dr B. Kesić, Director of the School of Public Health, Zagreb, for the meeting of the Scientific Group on Community and National Health Reference Centres for Research in Public Health Practice held in Geneva from 1 to 8 May 1961.

[1] Kesić, B. (1961) *Example of a local health study* (Unpublished working document WHO/Res. PHA/7).

## Joint FAO/WHO Expert Committee on Nutrition

A Joint FAO/WHO Expert Committee on Nutrition met in Geneva, from 18 to 25 April 1961, to review progress in the nutrition work of the two organizations since 1957,[1] examine current activities in this field, and advise on future programmes.

With the increased emphasis on international nutrition work during the past few years, there has been a corresponding increase in the funds available to fight malnutrition. For example, UNICEF is giving increasing aid to programmes for improving the nutrition of mothers and children, which are now being integrated with broader measures to raise family and community levels of living. Twenty-six projects of this more comprehensive type have been approved, and an average of $1 000 000 a year was allocated to them in 1959 and 1960. As FAO and WHO are responsible for giving technical advice on these projects, the Committee considered ways and means of speeding up their implementation, achieving co-ordination among the responsible national and local authorities, and helping governments in the wider application of the experience gained.

The shortage of suitably trained workers has been one of the drawbacks to nutrition programmes in many parts of the world. FAO and WHO have tried to help overcome this shortage by organizing training courses and providing fellowships for training abroad. In recent years UNICEF has allocated funds for assistance in this field, mainly in connexion with its programme of expanded aid to maternal and child nutrition. The Committee reviewed various aspects of nutrition training, including organization, length and type, categories of trainees, curricula, the strengthening of nutrition teaching in the basic curricula of medicine and agriculture, and community development.

While considerable advances have been made in the choice, preparation and testing of safe, cheap and digestible protein-rich foods, steps to popularize them have so far been of a limited and sometimes tentative nature. This has been due to lack of funds and also of knowledge and experience in this relatively new type of governmental procedure. The Committee accordingly devoted some time to the problem of promoting the acceptance and use of these foods.

The establishment or strengthening of nutrition services in member countries is an important part of the nutrition programmes of FAO and WHO. National nutrition committees have often been ineffective or ceased working because—among other reasons—they have had no clearly defined functions and programmes and have lacked the authority to influence national food and nutrition policy. The organization, composition, functions, and establishment of national nutrition bodies were discussed by the Committee.

Other questions reviewed by the Committee included the effect of maternal nutrition on the course and outcome of pregnancy, on perinatal mortality, and on lactation; the group feeding of manual and non-manual workers with the aim of improving their efficiency; marasmus and its public health significance; measurement of the food consumption and nutrition component in determining levels of living; and the classification of diseases of nutritional origin in connexion with the revision of the International Classification of Diseases.

An account of the Committee's work will appear in *WHO Chronicle* when its report is published.

## Health education in the USSR

Nineteen senior health officers from 18 countries took part in a WHO Travelling Seminar on Health Education, held from 13 May to 12 June 1961 in the USSR.

The inaugural session was held at the Central Institute for Scientific Research on Health Education in Moscow. Addresses of welcome were given by Dr M. Y. Nikitin, Deputy Minister of Health of the USSR, and Miss A. Helen Martikainen, Chief, Health Education of the Public, WHO Headquarters, Geneva.

The group, which consisted of professional health education specialists and senior health officers whose responsibilities include health education, visited Moscow, Leningrad, Tashkent in the Uzbek SSR, and the Crimea and Kiev in the Ukrainian SSR.

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1958, **149**.

The aim of the seminar was to learn how health education services at various levels of government in the USSR are planned and organized; what methods are used to train school teachers and health workers, particularly physicians, in health education; and what studies and research in health education methods are being carried out.

## Malaria eradication in Malaya

In a note in the April 1961 number of *WHO Chronicle*, it was stated (p. 160) that the Government of Malaya had decided to undertake an eradication campaign with help from WHO. In fact, the Government of Malaya has undertaken to carry out, with WHO assistance, a malaria eradication pilot project in an area of 400 square miles containing 110 000 people. The project is designed to find out whether indoor residual spraying on a total coverage basis, supplemented if necessary by drug distribution, will bring about the interruption of transmission in the area. If the pilot project shows interruption of transmission to be feasible and operational facilities to be within the resources of the state, the Government of Malaya may proceed with a full-scale eradication campaign.

## Improving rural hygiene

Tunisia's first 60 " sanitary and social workers " are now busy in various parts of the country after an accelerated course in health education, nutrition, rural hygiene, and maternal and child health. The WHO Regional Adviser for Health Education has reported that they are well received by the population; in fact, they have already persuaded villagers to accept certain changes in their way of life such as open windows and more hygienic preparation of food.

# *People and Places*

*Control of onchocerciasis*

Dr D. J. Lewis, a member of the scientific staff of the Medical Research Council of Great Britain, is spending four months in Venezuela as WHO consultant to study Simuliidae in relation to the distribution and control of onchocerciasis. Formerly medical entomologist to the Government of the Sudan, where he carried out research on *Simulium damnosum*, the local vector of onchocerciasis, Dr Lewis has investigated many entomological problems and recently studied Simuliidae and Phlebotominae in various parts of Africa and in British Honduras. As WHO consultant in Iran in 1960, he collaborated with members of the Teheran Institute of Parasitology and Malariology in a survey of the distribution of sandflies. He is a member of the WHO Expert Advisory Panel on Parasitic Diseases and has served on the WHO Expert Committee on Onchocerciasis.

*Paediatric education*

Since 1957 WHO has assigned Visiting Professors of Paediatrics to five programmes of paediatric education in India. The latest of these assignments is that of Dr Duncan Macaulay, of the United Kingdom, to the Paediatric Department of the Medical College Hospital, Agra, for a period of one year. As well as teaching all aspects of child health to undergraduate medical students, Dr Macaulay will help and advise in the further development of the Department.

Educated at Glasgow University, Dr Macaulay was lecturer at the Department of Child Health, University of Manchester, from 1951 to 1957, during which time he received a fellowship for paediatric research from the University of Pennsylvania, USA. He has been granted leave of absence from his posts as Consultant Paediatrician to the South Manchester group of hospitals and Honorary Clinical Lecturer in Paediatrics and Child Health at the University of Manchester to take up his WHO appointment.

*National laboratories in West Pakistan*

Dr Ulrich H. Krech, of Germany, has been assigned by the WHO Regional Office for the Eastern Mediterranean to advise the Government

of West Pakistan on the setting up of comprehensive national laboratories at the new capital of Islamabad, near Rawalpindi.

Dr Krech holds medical degrees from the Universities of Breslau, Marburg, and Berne, and has been a research fellow at Dr J. E. Salk's poliomyelitis vaccine laboratory in Pittsburgh. He has had wide experience in experimental virology and vaccine production. As chief of the virus department of the Swiss Serum and Vaccine Institute in Berne, from 1955 to 1960, he carried out extensive research on the diagnosis of virus diseases and actively contributed to the production of a Salk-type vaccine later used in mass vaccination campaigns. Dr Krech has carried out WHO assignments in Yugoslavia and the Philippines; he was a member of the WHO Study Group that drew up minimum requirements for smallpox vaccine, and acted as consultant to the WHO Study Group that prepared minimum requirements for inactivated poliomyelitis vaccine.

*Malaria adviser for South-East Asia*

Dr G. Sambasivan, of India, has been appointed WHO Senior Regional Malaria Adviser in South-East Asia.

Educated at Madras University and the School of Tropical Medicine, Calcutta, Dr Sambasivan entered the Indian Medical Service, and was Deputy Assistant Director of Malariology in South-East Asia Command from 1943 to 1948. Subsequently he became Assistant Director, Malaria Institute of India (Coalfields), under the Indian Ministry of Health.

During the past twelve years he has served as WHO malariologist in Thailand, the Philippines, Brunei, Burma, Afghanistan, and Indonesia. He has also visited malaria eradication programmes in Central America and in Europe.

*Public health administration*

Dr S. Malafatopoulos, of Greece, has been appointed as one of the public health administrators in the WHO Regional Office for Africa at Brazzaville. In this capacity, he will help the Organization develop advisory services for the strengthening of national health administrations.

Dr Malafatopoulos is a graduate of Athens Medical School and holds public health degrees from Johns Hopkins University, Baltimore, Md, USA. For two years he served as a public health consultant and medical zone officer with the Public Health Division of the US Economic Co-operation Administration (ECA) in his own country, and for four years he was Chief of Preventive Medicine with ECA in Libya, where he was in charge of trachoma control activities. Since joining WHO in June 1958, he has been medical officer in the public health programme in Panama, and chief country adviser to a public health project in Ecuador.

*New WHO Area Representative*

Dr Mario de Marchi, formerly Chief, Tuberculosis, WHO Headquarters, Geneva, has been assigned to the WHO Eastern Mediterranean Region as WHO Area Representative stationed in Pakistan. In this capacity, he will represent the WHO Regional Director and maintain liaison with the Government, the UN specialized agencies, and various national and international bodies in the area.

Dr de Marchi, who holds several medical degrees from the University of Rome and a Master's degree from the Italian Ministry of Public Instruction, has had twenty-five years' experience in public health administration and in the control of tuberculosis and tropical diseases in various parts of the world. As WHO adviser in Pakistan between 1953 and 1957, he took an active part in the organization of tuberculosis centres in Dacca, Chittagong, Rajshai and Sylhet.

*Laboratory services in South-East Asia*

Dr P. Tomasic has been appointed Laboratory Adviser at the WHO Regional Office for South-East Asia for a period of ten months. He will advise and assist in the planning and organization of laboratory services in countries of the region, and particularly in India.

Dr Tomasic graduated in medicine at Krakow University, and received post-graduate training in microbiology in Zurich, Copenhagen, and London. He is Chief of the Bacteriological Department, Central Institute of Hygiene, Zagreb, and is responsible for the organization and supervision of public health laboratory services in Croatia. He is a member of the WHO Expert Advisory Panel on Health Laboratory Methods and served on the WHO Expert Com-

mittee on Public Health Laboratory Services in 1956. He is also a member of the International Committee for Enteric Phage Typing.

*New Director of Health Services for Africa*

Dr C. M. Norman-Williams, of Nigeria, has been appointed Director of Health Services in the WHO Regional Office for Africa, Brazzaville, for a period of two years. So that he may take up this appointment, he has been seconded from his post of Chief Medical Adviser with the Federal Government of Nigeria.

Dr Norman-Williams has previously served as Deputy Medical Adviser for Nigeria and as Health Officer for Northern Nigeria. Since 1959, he has been Chief Delegate of Nigeria to the World Health Assembly and Nigerian Representative to the WHO Regional Committee for Africa.

*Headquarters appointments*

Dr A. V. Chaklin, of the USSR, was recently appointed Chief, Cancer, Division of Health Protection and Promotion, WHO Headquarters. After taking his medical degree at Saratov Medical Institute in 1943, Dr Chaklin served as an army surgeon until 1945. Between 1945 and 1949, he was ward surgeon and then head of the oncological ward at the Twenty-fifth of October Memorial Hospital, Leningrad. From 1950 to 1952, he was Head of the Curative and Prophylactic Division, Leningrad City Department of Health. In 1952 he became Head of the Organization and Method Department, Institute of Oncology, USSR Academy of Medical Sciences, in which capacity he has acquired a wide knowledge of the organization of cancer services and of the geographical pathology of cancer in the USSR. He has led six missions to study the distribution of cancer sites in various republics of the USSR. Dr Chaklin is scientific secretary of the committee of the USSR Academy of Medical Sciences that deals with malignant tumours. Before joining WHO, he was also a member of the National Organizing Committee for the International Cancer Congress, which will be held in Moscow in July 1962.

Dr J. Haworth has been appointed Medical Officer, Research and Technical Intelligence, Division of Malaria Eradication, WHO Headquarters, replacing Dr N. Chilton, who retired at the end of 1960. During the past seventeen years, Dr Haworth has worked in India, Nigeria, and the Somali Republic. In the two last-mentioned countries, he was closely connected with WHO-assisted malaria projects.

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## *Medical and paramedical staff in Albania*

According to a WHO consultant who has recently returned from Albania, the total number of doctors in the country increased from 102 in 1958 to 444 in 1960; during the same period the number of paramedical workers increased from 136 to 2927. About 90 doctors graduate from the Medical Faculty of Tirana every year.

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# *Review of WHO Publications*

*Ionizing Radiation and Health*, by Bo Lindell & R. Lowry Dobson, Geneva, 1961 (*World Health Organization: Public Health Papers*, No. 6), 84 pages. Price: 5/–, $1.00, or Sw. fr. 3.—.

This volume of the series *Public Health Papers* contains a report on the effect of radiation on health prepared for the World Health Assembly. The quantity of radiation to which man is exposed can be measured, and a comparison can be made between the amount to which he is exposed naturally and the amount to which he is now being exposed from man-made sources; but as yet knowledge on the relationship between radiation dose and biological effect is incomplete. Inferences cannot be drawn with full confidence from our experience with natural radiation, because of differences between natural and man-made radiation; for example, whereas natural radiation produces chronic low-level exposure with a dose-rate varying within a rather narrow range, the dose-rate from some artificial sources is much higher, even though the total dose may not be very different.

Present knowledge on radiation and health is brought together in this volume. There are sections on the biological effects of ionizing radiations, the interpretation of physical levels, current radiation protection work, and the present radiation pattern as described in physical terms. One of the annexes contains a glossary of technical terms.

*Basic Nursing Education Programmes: A Guide to their Planning*, by Katherine Lyman, Geneva, 1961 (*World Health Organization: Public Health Papers*, No. 7), 81 pages. Price: 5/–, $1.00, or Sw. fr. 3—.

In this latest issue in WHO's *Public Health Papers* series the knowledge and experience of a number of nurses—in national and international organizations and on the WHO Expert Advisory Panel on Nursing—have been pooled to provide a guide to the preparation of basic nursing education programmes. This is the final draft of the guide, previous drafts having been sent to various parts of the world to be tried out in practice and having been altered to incorporate suggestions made for improvements. It is thus an authoritative document, which distils much international experience and has stood the test of experience in the field.

Any plan for the education of nurses must be based on local resources and needs and adapted to the community in which the nurses will work. The guide is therefore in two parts: the first outlining the general and specific information about a community upon which planning for nursing education is based and suggesting methods for collecting it; the second sketching the steps whereby a basic nursing education programme is developed. Planning for an individual programme is conditioned by the organization of nursing education in a country, so national planning receives consideration as well as planning for an individual school.

*Study Group on Arthropod-borne Viruses: Report* (*World Health Organization Technical Report Series*, No. 219), Geneva, 1961, 68 pages. Price: 5/–, $1.00, or Sw. fr. 3.—.

The continual discovery of new arthropod-borne viruses causing disease in man and animals is of great significance in public health and in veterinary medicine, a full assessment of their importance depending upon the development of improved diagnostic and reporting systems.

This report of a WHO Study Group on Arthropod-borne Viruses [1] discusses the promo-

[1] Members of the Study Group: Professor D. Blaskovic, Czechoslovakia (Vice-Chairman); Major E. L. Buescher, USA; Dr J. D. Gillet, Uganda; Dr Hernando Groot, Colombia; Dr J. A. R. Miles, New Zealand (Rapporteur); Professor A. K. Schubladze, USSR; Dr C. E. Gordon Smith, United Kingdom; Dr R. M. Taylor, USA (Chairman); Dr H. Trapido, India. Representative of the Food and Agriculture Organization: Dr J. O. Deum. Secretariat: Dr R. W. Fay, WHO; Dr M. M. Kaplan, WHO; Dr W. C. Reeves, USA (Consultant); Dr A. C. Saenz, WHO (Secretary); Dr Telford H. Work, USA (Consultant); Mr J. W. Wright, WHO.

tion and co-ordination of research into these viruses. It outlines the procedures for determining their presence in hitherto unexplored or incompletely studied areas, and deals with the characteristics of enzootic foci, serological surveys (serological techniques, sampling methods, the preservation of serum specimens, etc.), and virus isolation (materials and methods, procedures for examining specimens, and identification of recovered viruses).

Classification systems, the criteria for acceptance of an arthropod-borne virus, and serological grouping and identification are examined. Attention is drawn to those fields of research where increased knowledge is essential for progress towards a better system of classification. The clinical, epidemiological, geographical and virological criteria for the diagnosis of virus infections are reviewed, and techniques of case-finding and systems of reporting discussed.

Other subjects covered include ecological aspects—biological and physical factors that influence virus transmission; the establishment and functions of reference laboratories, both central and regional; information exchange procedures, including an "Arthropod-borne Virus Information Exchange" newsletter and a catalogue of arthropod-borne viruses. The report concludes with an examination of control measures, summarizing the present position with regard to vaccine development, and giving illustrations of some important methods of vector and host control.

Appended to the report is a series of annexes tabulating natural sources and isolation and identification of arthropod-borne viruses; antigenic groupings; human infections caused by these viruses; confirmed arthropod-borne virus diseases to be reported to WHO/FAO as sporadic cases or epidemic outbreaks; the data to be provided on submission of virus strains for identification; and the names and addresses of ornithological centres specially devoted to miscellaneous collecting and taxonomic identification and of some outstanding parasitological centres for the biological study and identification of ectoparasites. Also included are facsimiles of a questionnaire for collecting information on virus strains, a punch card presenting data on an arthropod-borne virus, a key to the punch card catalogue of viruses, and the text of a letter to prospective contributors to the catalogue.

*Public Health Aspects of Low Birth Weight: Third Report of the Expert Committee on Maternal and Child Health* (*World Health Organization Technical Report Series*, No. 217), Geneva, 1961, 16 pages. Price: 1/9, $0.30, or Sw. fr. 1.—.

This report is reviewed in the article starting on page 259.

*Expert Committee on Health Statistics: Seventh Report* (*World Health Organization Technical Report Series*, No. 218), Geneva, 1961, 28 pages. Price: 1/9, $0.30, or Sw. fr. 1.—.

This report is reviewed in the article starting on page 262.

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## CORRIGENDA

Vol. 15, No. 4

**FOURTEENTH WORLD HEALTH ASSEMBLY — 1**

p. 124, left-hand column, l. 29

*delete* 750
*insert* 750 000

**PEOPLE AND PLACES**

p. 161, item headed *Health of seafarers*, left-hand column, l. 41

*delete* Physician
*insert* Venereologist

# GONORRHOEA

Failure to control gonorrhoea—*T. Guthe*

Treatment problems of gonorrhoea—*R. R. Willcox*

Gonococcal resistance to penicillin in the light of recent literature—*Charles M. Carpenter*

Surveillance studies of *Neisseria gonorrhoeae* sensitivity to penicillin and nine other antibiotics—*James D. Thayer, Frances W. Field, Miriam I. Perry, John E. Martin jr & Warfield Garson*

Possible effects of antibiotic treatment on the sensitivity and growth requirements of *Neisseria gonorrhoeae*—*Alice Reyn & M. W. Bentzon*

Problèmes posés par l'emploi de la streptomycine dans le traitement de la gonococcie—*Pierre Durel, Véra Roiron & Louis Delouche*

Fluorescent antibody methods for *Neisseria gonorrhoeae* identification—*Wilbur E. Deacon*

Epidemiological aspects of gonococcal infections—*R. R. Willcox*

Incidence, age distribution and complications of gonorrhoea in Sweden—*H. Gisslén, L. Hellgren & V. Starck*

The problem of gonorrhoea in England and Wales—*A. J. King & C. S. Nicol*

*Notes*

BULLETIN OF THE WORLD HEALTH ORGANIZATION

Vol. 24, No. 3, 1961, 106 pages

Price: 10/–, $2.00 or Sw. fr. 6.—